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EPA Superfund Record of Decision:

Fisher Calo Chem, IN

50272-101

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15. Supplementary Notes

16. Abstract (Limit: 200 words)

The Fisher Calo Chem site is in LaPorte County, Indiana. The site is comprised of the 33-acre One-Line Road facility, the 340-acre Two-Line Road facility, and the 170-acre Space Leasing facility. Surrounding the site are woodlands, grasslands, wetlands, and a wildlife area. Site contamination at all three facilities is the result of the production and distribution of industrial chemicals, and reclamation of waste paint and metal finishing solvents. From 1970 to 1985, packaging and storage violations were documented by the State during investigations. In 1979 when the State excavated buried drums from the One-Line Road facility, additional onsite contamination was identified. In 1982, EPA initiated site investigations that revealed elevated levels of organic compounds in ground water, heavy metals in the soil, and evidence of additional buried drums. Sampling and analysis continued until 1988, when EPA initiated a removal action to dispose of drums, tanks, and containers at the Two-Line Road facility. This Record of Decision (ROD) addresses the remaining contaminated areas including the soil, waste material, and structures at the site, and contaminated ground water in aquifers underlying the site. The primary contaminants of concern affecting the soil, debris,

(See Attached Page)

17. Document Analysis a. Descriptors

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Contaminated Media: debris, gw, soil
Key Contaminants: VOCs (TCE, toluene, xylenes), other organics (PAHs, PCBs), asbestos

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 72
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Abstract (continued)

and ground water are VOCs including TCE, toluene, xylenes; other organics including PAHs and PCBs; and asbestos.

The selected remedial action for this site includes excavation and incineration of semi-volatile and PCB-contaminated soil, with ash disposal location to be determined upon leaching test results; treatment of VOC-contaminated soil remaining in the excavated area using soil flushing or vapor extraction; limited asbestos removal/repair of structures and offsite disposal of any asbestos-containing materials, drums, tanks, or containers and their contents; treating ground water using an equalization/ sedimentation basin, granular activated carbon and air stripping, followed by filtration and reinjection of the treated water into the shallow aquifer to enhance soil ground water monitoring; and implementation of site access restrictions. The estimated present worth cost for this remedial action is $31,685,000, which includes an annual O&M cost of $9,379.000.

PERFORMANCE STANDARDS OR GOALS: Excavation levels for contaminated soil are based on TSCA standards and TBC criteria including PCBs 10 mg/kg. Ground water cleanup levels are derived from action levels adopted by the State from SDWA MCLs and MCLGs, including TCE 5 ug/l.

DECLARATION FOR THE RECORD OF DECISION

Site Name and Location

Fisher-Calo
Kingsbury, Indiana

Statement of Basis and Purpose

This decision document presents the selected remedial action for the Fisher-Calo site, in Kingsbury, Indiana which was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision document explains the factual and legal basis for selecting the remedy for this site. The attached index identifies the items which comprise the administrative record upon which the selection of a remedial action is based.

The State of Indiana concurs with the selected remedy. The letter of concurrence is attached.

Assessment of the Site

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this Record of Decision, may present an imminent and substantial threat to public health, welfare, or the environment.

Description of the Selected Remedy

This final remedy includes treatment of the principal threats posed by the site by (1) excavation and on-site incineration of the groundwater source and PCB areas; (2) groundwater collection, treatment and reinjection; (3) installation of a new water supply well; (4) an assessment and limited removal/repair of existing asbestos containing structures; and (5) soil gas testing, test pits and appropriate follow-up of Space Leasing and Kingsbury Industrial Development Park (KIDP) properties.

The major components of the selected remedy include:

* Installation of security fences around the One-Line Road property and the National Packaging property and an upgraded security fence around the Two-Line Road Property (see Figure).

* Excavation and incineration of soils containing semivolatiles and PCBs above established cleanup levels.

* Soil flushing or, if proven effective, soil vapor extraction for volatile organic compound (VOC)-contaminated soils which remain after excavation. These soils would be treated until levels of VOCs in soils are achieved that would allow attainment of established ground water cleanup levels.

* TCLP and EP Toxicity tests on the incineration ash residue to determine if the untreated ash may be disposed of onsite. If the ash passes the TCLP and EP Toxicity tests, it may be compacted and placed back onsite to fill excavation areas; if the ash does not pass the TCLP and EP Toxicity tests, it will be placed in a RCRA-compliant hazardous waste landfill.

* The installation of extraction wells to extract all contaminated groundwater. Following extraction, the contaminated groundwater will be pumped through a pipe network to a groundwater treatment facility. The treatment system will consist of an equalization/sedimentation basin, an air stripper tower, and a GAC column. Following treatment, water will be reinjected into the underlying shallow aquifer to flush contaminants from the soil as well as the ground water.

* The installation of an additional monitoring well system to determine the effectiveness of the remedy. An associated contingency plan will be developed to provide further remedial action in the event that the extraction wells are not effective in containing the contaminated plumes, or in the event that drinking water or health-based standards for any contaminant are exceeded in the future.

* A new production well capable of producing at least 500 gallons per minute. This well is needed to replace the capacity of an existing production well (well A) previously closed due to contamination.

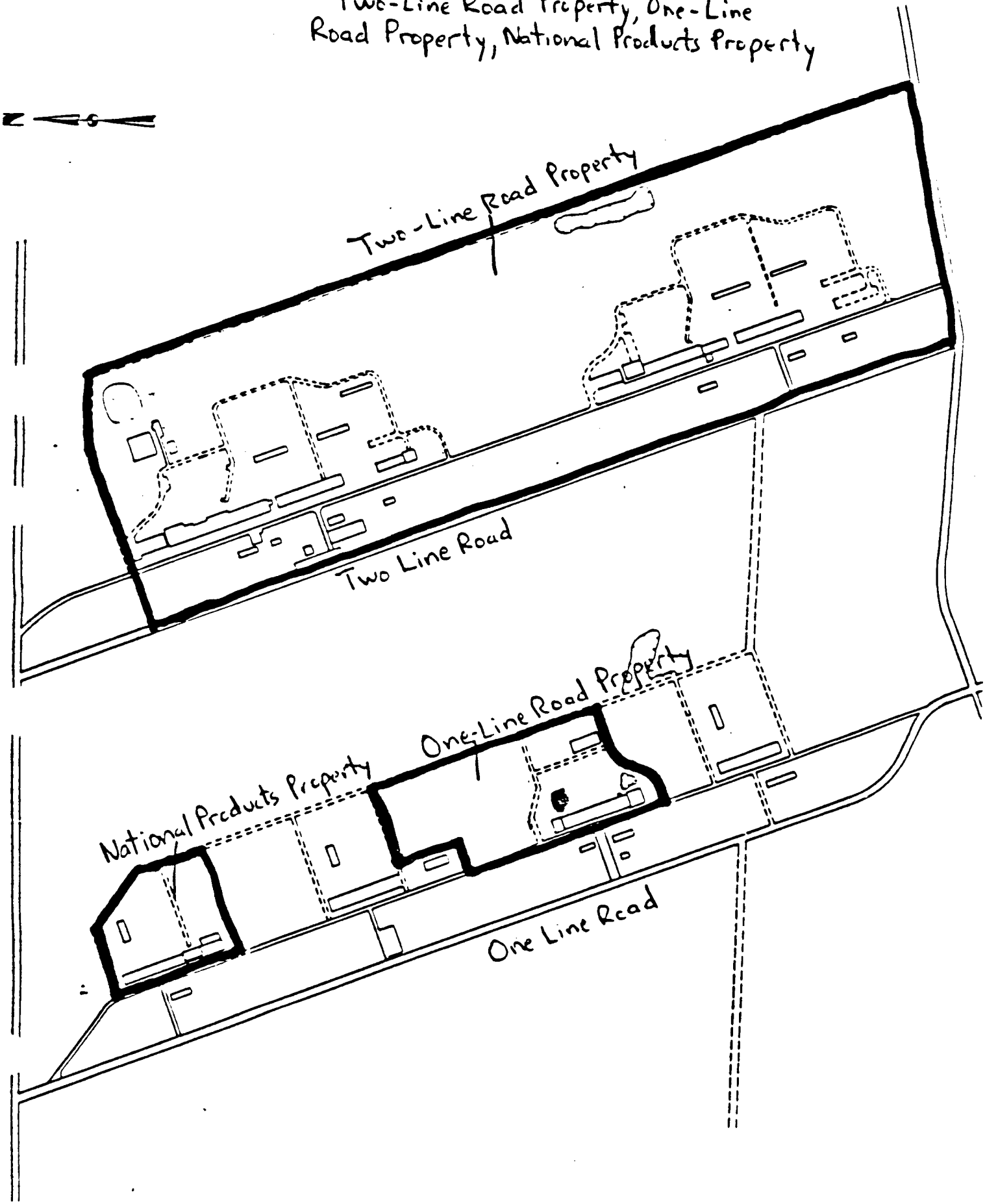
* An asbestos assessment and limited asbestos removal/repair of existing structures. All transite panels, intact thermal insulation, and other asbestos containing materials on building exteriors would be encapsulated. Under an asbestos management program, all friable, damaged Asbestos Containing Material (ACM) which is located outside of site buildings would be disposed of in an active waste disposal site in accordance with NESHAPs 40 C.F.R. 61.156.

* A buried drum investigation in two areas on the KIDP and Space Leasing property where drums and/or containers may have come to be located. Soil gas surveys and test pits shall be implemented in these areas to identify potential organic contamination. All drums, containers, container contents and contaminated soils in the areas will be properly disposed.

* Scoping and removal, if necessary, of drums, tanks and containers located at the One-Line Road property and immediately south of the National Packaging building.

Figure

Two-Line Road Property, One-Line Road Property, National Products Property



RECORD OF DECISION SUMMARY
FISHER-CALO SITE
KINGSBURY, INDIANA

I. SITE BACKGROUND

The Fisher-Calo site is located in the Kingsbury Industrial Development Park (KIDP) in LaPorte County, Indiana. The location of the site is shown in Figure 1. The KIDP is located in the southeast section of LaPorte County, approximately 12 miles southeast of LaPorte, Indiana. The communities of Kingsbury, 1.9 miles to the northwest, and Kingsford Heights, 1.6 miles to the southwest, are the major population centers located near the site.

The Fisher-Calo site is comprised of three facilities: the One-Line Road facility (now Cardinal Chemical), the Two-Line Road facility, and the Space Leasing Facility as shown in Figure 2. The Fisher-Calo One-Line Road facility is approximately thirty-three acres in size and is bordered to the north and south by grasslands and buildings. The area west of the One-Line facility contains scattered woodlands and fields. Travis Ditch and Kingsbury Creek parallel the western border of the facility.

The Two-Line Road facility is approximately 240 acres in size and is situated in surroundings similar to the One-Line facility. The land between the One-Line facility and Two-Line facility, as well as along the eastern and southern side of the Two-Line facility, is under cultivation with corn or soybeans. The area north of the Two-line facility and across Hupp Road (the main road in and out of the complex) was the site of munitions bunkers and is basically grassland with the aforementioned bunkers spaced throughout the area. To the south of the facility, the land consists of scattered woodlands and grassland. At the southeast corner of the Two-Line Road facility is a wetland area.

The Space Leasing facility is approximately 170 acres in size and is surrounded by munitions bunkers to the west, cropland to the north and south. To the east of Space Leasing, at the end of Hupp Road and approximately 15,000 feet from the One-Line Road, is the Kingsbury Fish and Wildlife area operated by the Indiana Department of Natural Resources.

A number of private wells are located at or near the Fisher-Calo site. Three production wells are located on the site proper and several residential and municipal wells are installed west and southwest of the site (see Figure 3).

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

Fisher-Calo was primarily involved in the packaging, storage, and distribution of industrial chemicals as well as the reclamation of waste paint and metal finishing solvents. Midwest Chlorine and Midwest Ammonia, which shared the One-Line facility, were involved in the production of sodium hypochlorite and the packaging of liquid chlorine, anhydrous ammonia, sulfur dioxide, anhydrous hydrogen chloride, and methylene chloride for sale to commercial users of these materials.

In 1970, Midwest Chlorine Corporation began operations at the One-Line facility. At this time, the disposal of solid waste and liquid waste at the site began. In 1972, Midwest Ammonia Corporation and Fisher-Calo Chemical Solvents, Incorporated began solvent reclamation operations at the One-Line facility. Drums containing still-bottom wastes were primarily stored at the One-Line facility. However, by 1973, drum storage, disposal and burial activities were occurring at Space Leasing Company. Fisher-Calo Chemical and Solvents, Incorporated had also commenced chemical processing activities in the buildings at the southern section of the Two-Line facility. In 1978, Fisher-Calo was formed through the merger of Fisher-Calo Chemical and Solvents, Incorporated, Midwest Ammonia Corporation, Midwest Chlorine Corporation, and Wallace Warehouse.

Throughout the history of these firms at the One-Line and the Two-Line facilities, there have been numerous inspections of the operations by the State of Indiana and other regulatory agencies. Numerous violations of environmental regulations were documented during these inspections. In addition, the following actions occurred as a result of regulatory inspections.

In June 1979, the Indiana State Board of Health (ISBH) excavated buried drums from a location in the northeast corner of the Fisher-Calo One-Line facility. During these activities, other potential burial and waste disposal areas were identified. In July 1980, U.S. EPA filed suit under Section 7003 of the Resource Conservation and Recovery Act (RCRA) to eliminate the hazards posed by the previous disposal activities at the Fisher-Calo facilities.

In 1982, EPA's Field Investigation Team (FIT) conducted an investigation of the site. Results of the sampling program indicated elevated levels of organic compounds in the groundwater, and heavy metals in surface soils. The FIT investigation also resulted in identification of a buried magnetic anomaly. Additional sampling was recommended to define this potential source of groundwater contamination and the potential for further contaminant migration. On December 30, 1982, the Fisher-Calo site was proposed for inclusion on the National Priorities List (NPL). On September 8, 1983, the site was promulgated on the first NPL.

In August 1982, U.S. EPA and Fisher-Calo entered into a Consent Decree. The Consent Decree required Fisher-Calo to monitor three selected monitoring wells on a quarterly basis to determine if the concentrations of certain priority pollutants would decrease with time. Following several years of monitoring, it became apparent that the contaminant levels had not decreased in the selected monitoring wells, thereby suggesting the continued presence of a contamination source. In January 1985, the Fisher-Calo solvent reclamation facilities ceased operations when Fisher-Calo Industries divested itself from its various divisions. In April 1985, EPA issued a Work Assignment to a contractor to conduct and perform an RI/FS at the Fisher-Calo site.

In December 1986, U.S. EPA requested that the scope of work at the Fisher-Calo site be expanded. The increased scope of work included sampling in suspected areas of past disposal and in selected areas adjacent to the Fisher-Calo site.

RI activities began in May 1987 and continued until August 31, 1987 when an arson fire at the Fisher-Calo site trailer halted field activities. The remaining RI activities were conducted from May through November 1988.

Presently, no new waste materials are being received at the facility. However, drummed wastes and tanks containing waste are still being stored at both the north and south sections of the Two-Line facility. Some solid waste and drummed waste materials are also still being stored at the One-Line facility. Removal actions are taking place at the Two-Line facility under the direction of U.S. EPA. It has been assumed that all drums, tanks, and containers at the Two-Line facility requiring remedial action will be satisfactorily resolved in these actions. They are not, therefore, included in discussions and cost estimates in this Record of Decision.

III. COMMUNITY RELATIONS HISTORY

U.S. EPA published the Proposed Plan in accordance with CERCLA Section 117. This document and the Feasibility Study (FS) Report were made available to the public on April 13, 1990, at the beginning of a 30 day public comment period. The public comment period was subsequently extended an additional 30 days to accommodate a request by the Potentially Responsible Party (PRP) Steering Committee and the LaPorte County Health Department. A public meeting was held on April 26, where approximately 50 people attended and expressed their concerns. Comments received during the public comment period and the responses to those comments are contained in the Responsiveness Summary (Appendix A).

IV. SCOPE AND ROLE OF THE RESPONSE ACTION

U.S. EPA initiated a Remedial Investigation and Feasibility Study at the Fisher-Calo Site in April of 1985 when a Work Assignment was issued to one of the agency's contractors. The RI/FS activities involved determining the

nature and extent of contamination at the site and evaluating the feasibility of various remedial alternatives to clean up the site.

This Record of Decision (ROD) addresses contaminated soil, waste material and structures on the site, and contaminated groundwater in the underlying aquifers. Groundwater contamination was determined to be the primary exposure risk, with surface soil, the Cardinal Chemical discharge lagoon, and asbestos containing site structures and waste materials identified as additional risks. These areas were determined to be threats due to the potential risk from ingestion, direct contact and inhalation of the contamination. This is the first and only planned remedial response action at the site.

V. SITE CHARACTERISTICS

Former Fisher-Calo properties are presently occupied by several independent companies which are actively doing business. The current site facilities are shown on Figure 2. Fisher-Calo sold the properties located on One-Line Road. The current owners are operating from the facilities on these properties. The remaining Fisher-Calo properties are leased and are used for warehousing, packaging, or production. The currently operating facilities on the Fisher-Calo site properties include:

One-Line Road

- National Packaging: Product packaging and distribution
- Cardinal Chemical: Chemical manufacturing, including chlorine, anhydrous ammonia, methylene chloride, and others

Two-Line Road

- Fisher-Calo Chemical Plant (Acid products): Warehousing and blending of non-hazardous liquids
- New Plant Life: Manufacturing of plant food, fertilizers and various related products (currently shutdown)
- National Packaging: Warehousing
- Huber Marine: Boat storage
- Megan Chemical: Vertical tank ownership
- Polar Molecular: Blending of chemicals

Other areas outside of the Fisher-Calo properties on adjacent KIDP land are occupied by actively operating independent industries. From information and data collected to date, some of these active operations are within the contaminated and potentially contaminated areas.

A removal action at the north end of the Two-Line facility is being conducted under a Unilateral Removal Order issued by U.S. EPA. The removal action is being carried out in two-phases: Phase I involves the staging of drums for removal during Phase II. Phase II includes the excavation of the contaminated soils and buried tanks and drums located on the north end of the Two-Line Road property. The visibly contaminated soils, tanks and drums will be removed from the north end of the Two-Line Road facility and transported to an appropriate disposal facility. A further removal action is being scoped for the south end of the Two-Line facility. For the purposes of this Record of Decision, it is assumed that all drums, tanks, and containers on the Two-Line Road property requiring remedial action are being addressed by these actions. Additional areas on the One-Line facility and immediately south of the National Packaging building may require removal actions. These areas are addressed in this ROD.

Data gathered during the Remedial Investigation (RI) at the Fisher Calo Site indicate the following:

- An upper and a lower aquifer have been identified at the site.
- The upper, unconfined aquifer extends from the top of the water table (ranging from 3 to 20 feet below the ground surface) to the top of a silty clay deposit and is between 40 to 75 feet thick.
- A silty clay aquitard underlies the upper aquifer throughout much of the study area and is approximately 9 to 17 feet thick.
- The surface of the silty clay aquitard exhibits an elongated depression that trends northwest to southeast across the center of the site.
- A lower aquifer lies between the aquitard and an underlying hard, dense clayey silt deposit believed to be a basal till.
- Groundwater flow in the upper aquifer at Fisher-Calo is to the south and southwest, which is consistent with regional flow patterns.
- Groundwater velocity in the upper aquifer varies according to depth, ranging from 211 ft/yr in the shallow portion, to 131 ft/yr in the intermediate portion, to 41 ft/yr in the deep portion. However, actual groundwater velocities will vary across the aquifer due to variation in the composition of the aquifer as well as variations in hydraulic gradient.
- Based on the results of the sampling and analysis from two monitoring wells in the lower aquifer, the lower aquifer does not appear to be affected by groundwater contamination.
- Groundwater discharge is occurring at production wells, residential wells, Kingsbury Creek, Travis Ditch, and the Kankakee River.

- The contaminants present in the saturated zone were comparable between soils and groundwater. With one exception, contamination appears to be limited to the shallow and intermediate portions of the upper aquifer at discrete locations across the project study area. The deep portion of the upper aquifer in the Cardinal Chemical area is contaminated.

- The primary contaminants of concern in groundwater are the following chlorinated organics: 1,1,1-trichloroethane, 1,2-dichloroethene, 1,1-dichloroethane, trichloroethene, and methylene chloride.

- At least three individual contamination plumes have been identified (See Figure 4):

  - One plume is located downgradient of the old waste disposal area at the Fisher-Calo Plant.

  - The second plume appears to originate near the National Packaging Facility.

  - Based on the variation of compounds detected in each well nest, there may be several plumes present near the Cardinal Chemical Company facility.

- Five specific locations were identified as having contaminated subsurface soils that are likely sources of groundwater contamination; other than these areas, the unsaturated zone was relatively clean. All five locations contained the contaminants that were detected in the groundwater.

- At some of the locations where the unsaturated zone was clean, significant contamination was exhibited in the saturated zone. These contaminants are being transported by the groundwater and will be addressed as such.

- Surface soils at the site are contaminated with the following chemicals of concern: 1,1,1-trichloroethane (TCA), bis (2-ethylhexyl) phthalate, isophorone, polynuclear aromatic hydrocarbons (PAHs), and Arochlor-1260 (PCB). The Cardinal Chemical Facility area was the most heavily contaminated area.

- Elevated concentrations (above 1,000 ug/kg) of organic contaminants exist in areas where drums are or were stored, where waste lagoons were present at one time, or where waste disposal pits existed. These locations on Two-Line Road property are targeted for the surface soil removal program currently being carried out as part of the removal action under the Unilateral Administrative Order.

- Many of the contaminants detected in the surface soils were also detected in the subsurface soil and groundwater samples. Additional contaminants were found in the subsurface soil that were not detected at the surface, including VOCs such as TCE, tetrachloroethylene, toluene, and xylene.

- Surface water samples from Travis Ditch, Kingsbury Creek and the Kankakee River did not contain elevated concentrations of contaminants. The sediment samples collected from the discharge lagoon on Cardinal Chemical property contained elevated levels of Arochlor-1260, chloroform, and bis (2-ethylhexyl) phthalate.

- Two areas of potentially buried waste materials were identified: one on Space Leasing Property; the other just southeast of the Cardinal Chemical Plant buildings (See Figures 13 and 14). Elevated soil gas readings were observed on the Space Leasing Property, and elevated soil gas readings were observed and subsurface ferrous material was identified during a magnetometer survey on the property southeast of Cardinal Chemical.

Post Remedial Investigation Information

After RI field work was completed, two additional sampling efforts indicated that (1) asbestos is present within the buildings on the north end of Two-Line Road property and (2) no downgradient private or municipal wells were contaminated with volatile organic compounds (VOCs). Both operating KIDP production wells were also tested and showed no VOC contamination; however, a third production well, KIDP well A, had been previously shut down due to VOC contamination.

VI. SUMMARY OF SITE RISKS

The Risk Assessment for the Fisher-Calo Site indicated that the primary exposure pathway was through the groundwater, and that the contaminant concentrations in each of the identified contaminant plumes could present an unacceptable risk to human health. Soils in some areas of the site are considered to be sources of groundwater contamination. Potentially buried drums may also be a continuing source of groundwater contamination. Asbestos contained in materials laying on the ground and asbestos which may be present in building exterior construction materials may present an unacceptable risk to human health. Additionally, the Cardinal Chemical discharge lagoon could present an unacceptable risk to human health; other surface waters near the site do not.

VII. DESCRIPTION OF ALTERNATIVES

The U.S. EPA has identified and evaluated an array of remedial alternatives that could be used to remedy the Fisher-Calo site. The alternatives presented here are those that survived preliminary screening to undergo detailed analysis. In evaluating these alternatives, U.S. EPA considered the following nine criteria:

1. Overall Protection of Human Health and Environment addresses whether a remedy provides adequate protection, and describes how risks are eliminated or reduced through treatment, engineering controls, or institutional controls.

2. Compliance with ARARs addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements (ARARs) of other environmental statutes and/or provide grounds for invoking a waiver.

3. Long-term Effectiveness and Permanence refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once the remedial goals have been met.

4. Reduction of Toxicity, Mobility, or Volume is the anticipated performance of the treatment technologies that a remedy may employ.

5. Short-term Effectiveness involves the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, and until remedial goals are achieved.

6. Implementability is the technical and administrative feasibility of a remedy, including the availability of the goods and services needed to implement the chosen solution.

7. Cost includes capital and operation and maintenance (O&M) costs.

8. Support Agency Acceptance indicates whether, based on its review of the RI/FS and Proposed Plan, the support agency (IDEM) concurs, opposes, or has no comment on the preferred alternative.

9. Community Acceptance is the degree to which the community supports the remedy selected.

The alternatives that underwent detailed analysis are briefly described below. Refer to Tables 1 and 2 for a summary of the key points and the cost of each alternative. Detailed descriptions of each alternative are presented in the FS report.

Alternative 1 - No Action

The no action alternative would not involve any remedial actions and the site would remain in its present condition. No funds would be expended for monitoring, control, or clean up of the contaminated source area and groundwater. This alternative, which is required by the NCP and SARA, is a baseline against which the effectiveness of other alternative remedies is compared.

Alternative 2- Source Containment, Groundwater Collection, and Discharge

Alternative 2 includes a multimedia Subtitle C RCRA cap over all areas as identified in Figures 5 through 8; groundwater collection and discharge to Travis Ditch; the installation of a new water supply well; assessment and limited removal/repair of existing, asbestos-containing structures; and soil gas testing, test pits and appropriate follow-up of Space Leasing and KIDP properties.

The areas to be capped would first be cleared and graded. Next a multimedia Subtitle C RCRA cap would be installed over the designated areas. The cap from bottom to top would consist of compacted clay, synthetic membrane, a drainage layer, compacted native soil, top soil and a vegetative layer. A cross-section of the cap is shown on Figure 9.

Extraction wells would be installed to hydraulically contain and extract the contaminated plumes at the Fisher-Calo site. From the extraction wells, water would be pumped to one of three Travis Ditch National Pollution Discharge Elimination System (NPDES) discharge points.

A monitoring well system would be installed to determine the effectiveness of this alternative, and a contingency plan would be developed to provide further remedial action in the event that the extraction wells are not effective in containing the contaminated plumes.

A new production well would be installed capable of producing at least 500 gallons per minute. This well is needed to replace the capacity of an existing production well (well A) previously closed due to contamination. This well would be drilled through the upper aquifer and silty-clay aquitard and penetrate the lower, semi-confined aquifer.

An asbestos assessment and limited asbestos removal/repair of existing structures on the Two-Line Road property would also be performed. All transite panels and intact thermal insulation would be encapsulated. Under an asbestos management program, all friable, damaged Asbestos Containing Material (ACM) would be wet cleaned or HEPA vacuumed. Dust from the entire building is assumed to be a possible bearer of asbestos fibers and all surfaces would be wet cleaned or HEPA vacuumed by qualified asbestos workers.

Alternative 3 - In-situ Stabilization, Groundwater Collection, Treatment, Reinjection, Bioremediation

Alternative 3 includes the in-situ stabilization of groundwater source and PCB areas; groundwater collection, treatment, and reinjection; installation of a new water supply well; an assessment and limited removal/repair of asbestos containing existing structures; and soil gas testing, test pits and appropriate follow-up of Space Leasing and KIDP properties.

The areas to be in-situ solidified/stabilized are identified in Figures 10 through 12. A vertical drive auger would be used to process approximately 50,000 square feet of soil to a depth of approximately 17 feet nominal groundwater depth. An overlapping drilling procedure would be used in order to ensure complete treatment.

Extraction wells would be installed to hydraulically contain the contaminated plumes at the Fisher-Calo site, as discussed for Alternative 2. Following extraction, the water would pass through a GAC column, air stripper tower and a multimedia filter. The treated water would then be pumped to upgradient injection wells where nutrients and terminal electron acceptors would be added. The water will then pass through a micro-filter and then be reinjected into the contaminated aquifer. The nutrients and terminal electron acceptors will biostimulate indigenous micro-organisms to degrade groundwater contaminants.

A monitoring well system and associated contingency plan, and a new production well will be installed. An asbestos assessment and limited asbestos removal/repair of existing structures would be performed as discussed for Alternative 2.

Alternative 4 - Limited Excavation, Onsite Incineration, Groundwater Collection, Treatment, Discharge

Alternative 4 includes the excavation and onsite incineration of groundwater source and PCB areas; groundwater collection, treatment and discharge to Travis Ditch; installation of a new water supply well; an assessment and limited removal/repair of existing asbestos containing structures; and soil gas testing, test pits and appropriate follow-up of Space Leasing and KIDP properties.

The areas to be excavated and incinerated are identified in Figures 10 through 12. Approximately 29,500 cubic yards of soil would be excavated and incinerated in a circulating bed combustion (CBC) unit. TCLP and EP Toxicity tests would be performed on the ash residue to determine if the untreated ash may be disposed of onsite. If the ash passes the TCLP and EP Toxicity tests, the ash would be compacted and placed back onsite to fill excavation areas; if the ash does not pass the TCLP and EP Toxicity tests, the ash will be disposed in a RCRA compliant hazardous waste landfill.

Extraction wells will be installed to extract all contaminated groundwater. Following extraction, the contaminated groundwater would be pumped through a pipe network to a groundwater treatment facility. The treatment system would consist of an equalization/sedimentation basin, GAC column, and an air stripper tower. Following treatment, water would be pumped to a Travis Ditch NPDES discharge point.

A monitoring well system and associated contingency plan and a new production well will be installed. An assessment and limited asbestos removal/repair of existing structures would be performed as discussed in Alternative 2.

Alternative 5 - Limited Excavation, Onsite Landfill, Groundwater Collection, Treatment, Discharge

Alternative 5 includes the excavation and onsite landfilling of groundwater source and PCB areas; groundwater collection, treatment and discharge to Travis Ditch; installation of a new water supply well; assessment and limited removal/repair of asbestos containing existing structures; and soil gas testing, test pits and appropriate follow-up of Space Leasing and KIDP properties.

Approximately 29,500 cubic yards of soil would be excavated and placed in an onsite landfill. The areas to be excavated are identified in Figures 10 through 12. The landfill would be located between One-Line and Two-Line Road and would lie partially below grade, maintaining at least 10 feet between the bottom of the landfill and the groundwater table as required by RCRA. After contaminated soils have been excavated and placed in the landfill, the landfill would be closed by capping with a multi-layer RCRA Subtitle C cap.

A groundwater treatment scheme would be installed as discussed for Alternative 4. A monitoring well system and associated contingency plan and a new production well would be installed. An assessment and limited asbestos removal/repair of existing structures would be performed as discussed for Alternative 2.

Alternative 6 - Extensive Excavation, Soil Wash, Onsite Landfill, Groundwater Collection, Treatment, Discharge

Alternative 6 includes the excavation and soil washing of all contaminated areas and onsite RCRA Subtitle C landfilling of soil wash residuals; groundwater collection, treatment and discharge to Travis Ditch; installation of a new water supply well; assessment and complete removal of existing structures; and soil gas testing, test pits and appropriate follow-up of Space Leasing and KIDP properties.

Approximately 235,500 cubic yards of soil would be excavated and treated using onsite soil washing. The areas to be excavated are identified in Figures 5 through 8. Following excavation, soils will be temporarily placed in a pre-fabricated building; excavation and treatment of the soil will occur simultaneously in a coordinated effort. The contaminated soil will be fed to the treatment plant at the sites. After the soil wash process, "cleaned" soil will be placed back onsite. Contaminated froth filter cake will be produced by the process. This material will be disposed of in an on-site RCRA landfill in a manner similar to that discussed for Alternative 5. A groundwater treatment scheme will be installed similar to that discussed for Alternative 4. A monitoring well system and associated contingency plan and new production well will be installed as discussed for Alternative 2. An assessment and complete removal of existing asbestos-containing structures on Two-Line road property would be performed.

Alternative 7 - Extensive Excavation, Onsite Incineration, Groundwater Collection, Treatment, Discharge

Alternative 7 includes the excavation of all contaminated areas; the onsite incineration of organically contaminated soils and the onsite RCRA landfilling of inorganically contaminated soils and soils which do not pass the TCLP and EP toxicity tests; groundwater collection, treatment and discharge to Travis Ditch; installation of a new water supply well; assessment and complete removal of existing asbestos containing structures; and soil gas testing, test pits and appropriate follow-up of Space Leasing and KIDP properties.

Approximately 180,000 cubic yards of organically-contaminated soil would be excavated and treated using a CBC incinerator. The soils with organic contamination identified in Figures 5 through 8 contain, in some instances, high inorganic concentrations. TCLP and EP toxicity tests would be performed on the ash residue to provide information on whether or not untreated ash may be disposed of onsite. If untreated ash passes the TCLP and EP toxicity tests, the ash would be placed onsite. Soils that do not pass the TCLP and EP Toxicity tests would be placed in an onsite RCRA landfill.

Approximately 53,500 cubic yards of inorganically-contaminated soil would be excavated and placed in an onsite RCRA landfill. The construction and operation of this landfill would be similar to that discussed for Alternative 5.

A groundwater treatment scheme will be installed similar to that discussed for Alternative 4. A monitoring well system and associated contingency plan and new production well will be installed as discussed for Alternative 2. An assessment and complete removal of existing asbestos containing structures on Two-Line road property would be performed.

Alternative 8 - Extensive Excavation, Offsite Landfill, Groundwater Collection, Treatment and Discharge

Alternative 8 includes the excavation and offsite disposal of all contaminated areas; groundwater collection, treatment and discharge to Travis Ditch; installation of a new water supply well; assessment and complete removal of existing asbestos containing structures; and soil gas testing, test pits and appropriate follow-up of Space Leasing and KIDP properties.

Approximately 235,500 cubic yards of soil would be excavated and disposed of in an offsite RCRA hazardous waste landfill. The areas to be excavated are identified in Figures 5 through 8. All contaminated soils would be transported in accordance with the regulations governing the transportation of hazardous materials as listed in the Code of Federal Regulations (CFR), Title 49 and any applicable state regulations. Clean imported fill would be used for backfilling excavated areas. These areas would be graded to near pre-construction elevations, covered with clean top soil and then reseeded.

A groundwater treatment scheme would be installed similar to that discussed for Alternative 4. A monitoring well system and associated contingency plan and new production well would be installed as discussed for Alternative 2. An assessment and complete removal of existing asbestos containing structures on Two-Line Road property would be performed.

VIII. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

The nine criteria used for evaluating the remedial alternatives listed above include: overall protection of human health and the environment; compliance with ARARs; long-term effectiveness; reduction of toxicity, mobility or volume; short-term effectiveness; implementability; cost; State of Indiana acceptance; and acceptance by the communities of Kingsbury and LaPorte, Indiana.

Based on these nine criteria, the U.S. EPA and IDEM have selected Alternative 4 as the preferred alternative for the remedial action at the Fisher-Calo Site. The preferred alternative entails limited excavation of groundwater source and PCB areas; on-site incineration of excavated soils; groundwater collection , treatment and discharge to Travis Ditch; installation of a new water supply well; assessment and limited removal/repair of existing asbestos containing structures; soil gas testing, test pits, and appropriate follow-up of Space Leasing and KIDP properties; and groundwater monitoring and the development of a contingency plan.

Due to comments received during the public comment period, four elements of the preferred Alternative 4 were changed. First, it was determined that it would be more protective and effective to reinject the discharge stream from the groundwater treatment plant back into the site's shallow aquifer rather than discharge it to Travis Ditch. Second, certain operation and

maintenance costs which were omitted from the preferred Alternative 4 needed to be added. Third, immediate fencing of the One-Line Road property, the National Packaging property, and unsecured perimeter areas of the Two-Line Road property shall be implemented to prevent access and unauthorized entry onto these properties. Fourth, soil flushing, or soil vapor extraction if proven effective, will be employed to treat soils contaminated with volatile organic compounds (VOCs) rather than incinerating these soils. It was determined that this treatment would be more effective than incineration for VOC-contaminated soils remaining after excavation of PCB and semivolatile-contaminated soils. The net result of these changes to the preferred alternative is that the estimated cost of the selected remedy is now $31,685,000 as compared to the $27,402,000 estimate for Alternative 4 in the Proposed Plan. This is a net increase of $4,283,000.

Analysis

Overall Protection - With the exception of Alternative 1 and the portion of Alternative 2 allowing discharge of untreated groundwater to Travis Ditch, all of the alternatives would provide adequate protection of human health and the environment. The preferred alternative provides protection against an existing risk by providing an alternative water supply (i.e. replacing well A); protection against direct contact or soil ingestion by removing the primary areas of surface contamination; protection against asbestos exposure by assessment and limited removal/repair of existing structures; and protection against future risk of groundwater ingestion through excavation of groundwater source areas, collection and treatment of contaminated groundwater, and groundwater monitoring and development of a contingency plan.

Compliance with ARARs - No location-specific ARARs were identified for the Fisher-Calo Site. With the exception of Alternatives 1 and 2, all alternatives would comply with all chemical-specific and action-specific ARARs. Alternative 2 would comply with action-specific ARARs, but not all chemical-specific ARARs; Alternative 1 would not comply with either type of ARARs.

Long-Term Effectiveness - Alternatives 3,4,5,6,7 and 8 would provide good long-term effectiveness by protecting against: existing risk from well A; direct contact or soil ingestion, future risk of groundwater ingestion; and asbestos exposure. Alternative 1 would leave all contaminated soils and groundwater in place and would have poor long-term effectiveness. Alternative 2 would provide good long-term effectiveness against all of the risks listed above but would potentially create additional risk through discharge of contaminated groundwater to Travis Ditch. In addition, alternative 2 would allow contaminated soils to remain in place and would provide a cap over soils, which would increase the duration of the required groundwater pumping efforts. Alternative 3 would provide an additional measure of control against contaminant migration in groundwater source and PCB areas but does not address remaining areas of soil contamination. Additionally, Alternative 3 provides a measure to flush contaminants from the soil matrix. Alternatives 4 and 5 provide for excavation and removal of

groundwater source and PCB areas. An incinerator residue is all that would remain to be managed in these removal areas for Alternative 4, and Alternative 5 would provide a centralized location for contaminated soils and preventative measures for contaminant migration into groundwater. Neither alternative would provide action for remaining areas of soil contamination, and Alternative 5 would allow materials to remain in the vicinity of the site. Alternatives 6,7, and 8 would provide an added degree of soil excavation, would serve to reduce the period required to pump and treat contaminated groundwater, and would provide full remediation of asbestos containing structures as opposed to stabilizing asbestos and allowing it to remain in place. Alternative 8 would be the most effective remedy by physically removing contaminated soils from the site.

Reduction of Toxicity, Mobility or Volume - The table below provides a relative ranking of alternatives for this criterion.

Alternative	Toxicity Reduction	Mobility Reduction	Volume Reduction
1	None	None	None
2	None	Intermediate	Minimal
3	None	Intermediate	Minimal
4	Intermediate	Intermediate	Intermediate
5	None	Intermediate	Minimal
6	Intermediate	Intermediate	Minimal - Asbestos Only
7	Significant	Significant	Significant
8	Significant with respect to site only	Significant	Significant with respect to site only

Short-Term Effectiveness - Implementation of Alternative 1 would not produce any short-term impacts to the community, workers, or the environment. Excavation of tests pits on Space Leasing and KIDP property, which is included in alternatives 2 through 8, could expose workers and the environment to contaminated materials or vapors. Limited asbestos removal and repair, which is included in Alternatives 2 through 5, could create a short-term exposure to workers, the community, and the environment. Complete asbestos removal would create a more significant potential exposure to asbestos (Alternatives 6, 7 and 8). Limited excavation provided in Alternatives 4 and 5, and more significantly, extensive excavation in Alternatives 6, 7, and 8, would potentially expose workers, the community, and environment to volatile organics and dust released during excavation activities. Additionally, incineration of contaminated soils provided in Alternatives 4 and 7 could create exposure to contaminants during startup and shutdown periods or malfunctions; however, these occurrences are expected to be minimal. Alternatives 5 and 6, and to a much greater extent, Alternative 8, could potentially expose the workers, community, and environment to contamination during transportation and emplacement of materials into the landfill.

Implementability - With the exception of Alternatives 3 and 6, which use innovative technology and as such may require special construction and operation, all alternatives would utilize standard monitoring and construction techniques which would be readily implementable. The NPDES permit required as part of Alternative 2 may not be possible to obtain.

Cost - The costs of each alternative are presented in Table 2 and are summarized below:

Alternative	Capital Cost	O & M	Total Present Worth
1	$0	$0	$0
2	$6,449,000	$7,057,000	$13,506,000
3	$6,553,000	$10,013,000	$16,566,000
4	$22,306,000	9,379,000	$31,685,000
5	$28,611,000	$1,158,000	$29,769,000
6	$73,624,000	$26,250,000	$99,874,000
7	$137,449,000	$8,434,000	$145,883,000
8	$149,095,000	$344,000	$149,439,000

State Acceptance - The State of Indiana supports the preferred alternative.

Community Acceptance - Community acceptance of the preferred alternative is evaluated in the attached Responsiveness Summary.

IX. THE SELECTED REMEDY

The selected remedy for the Fisher-Calo Site is Alternative 4, as amended by the changes made in response to public comments (i.e. reinjection of treated groundwater as opposed to discharge to Travis Ditch, the revised cost estimate, fencing, and flushing/soil vapor extraction of VOC-contaminated soils as opposed to incineration). Based on current information, this alternative provides the best balance among the alternatives with respect to U.S. EPA's nine criteria.

Fencing

The facility shall be fenced in a manner sufficient to prevent access to the One-Line Road facility, Two-Line Road facility, and National Packaging facility. Warning signs shall be posted at 200-foot intervals along the fence advising that the area is hazardous due to chemicals in the soils which may pose a risk to public health. Such signs may be removed once all soil remediation activities are completed.

Soil Excavation and Incineration

Soil sampling sufficient to fully delineate the horizontal and vertical extent of contamination in the semivolatile and PCB areas, shown approximately on Figures 10 through 12, and all areas covered by the prior and ongoing removal actions shall be conducted. Soil shall be excavated and incinerated until all of the following cleanup levels have been achieved:

contaminant	cleanup level
PCBs	10 ppm
isophorone	18 ppm
bis(2-ethylhexyl) phthalate	5.4 ppm

All necessary measures shall be taken during excavation to ensure that the release of contaminants to the air is minimized. Excavated areas shall be backfilled with clean imported fill and/or incineration ash which passes the TCLP and EP Toxicity tests.

All excavated soils shall be incinerated in an on-site combustion unit capable of achieving compliance with all requirements of RCRA, TSCA and any applicable state laws or regulations. Prior testing shall be performed to determine the suitability of the unit for meeting destruction efficiences and other requirements of RCRA, TSCA and state regulations.

TCLP and EP Toxicity tests shall be performed on the ash residue to provide data to determine whether untreated ash may be disposed of onsite. If the untreated ash passes the TCLP and EP Toxicity tests, the ash may be placed back onsite to fill excavation areas. Clean soil cover shall be placed over ash backfill to allow vegetative growth similar to that in areas surrounding the excavation areas. Ash which does not pass the TCLP and EP Toxicity tests shall be transported to an offsite RCRA-compliant landfill.

Soil Flushing/Soil Vapor Extraction

During Remedial Design, cleanup levels of VOCs in soils shall be established which shall ensure that the groundwater cleanup levels established below be attained. VOC-contaminated soils which remain after excavation of PCB and semivolatile-contaminated soils shall be treated until the established VOC soil cleanup levels are achieved. Treatment of these soils shall include, at a minimum, soil flushing. If other treatment methods such as soil vapor extraction or nutrient additions to soil flushing can be proven effective for achieving the VOC soil cleanup levels, then these methods may be employed after such proof is made.

Groundwater Extraction, Treatment and Reinjection

Pre-design work shall be performed to ensure that extraction well placement

will be sufficient to hydraulically contain and remove the three contaminant plumes identified during the Remedial Investigation (see figure 4) as well as any other plumes identified during remedial design of remedial action , and ensure that injection wells will be placed properly to optimize flushing and plume containment. Based on the pre-design work, extraction wells shall be installed to hydraulically contain the contaminant plumes and extract contaminated groundwater for treatment.

Following extraction, the groundwater shall be pumped to an equalization/sedimentation basin and then passed through an air stripper tower. The treated water shall be pumped to the injection wells, passed through a micro-filter, and then reinjected into the contaminated aquifer. Reinjection shall be performed to flush contaminants from the soils as well as the ground water. The contaminated air from the air stripper shall be passed through a GAC column to remove organic contaminants. Contaminated GAC shall be disposed of in a manner which shall minimize the release of contaminants to the air.

The extraction and treatment system shall be operated until the concentrations of the following contaminants in the groundwater monitoring wells at the downgradient plume boundary do not exceed the concentrations listed below, or standards or levels which are promulgated in the future, for eight consecutive quarterly monitoring events:

contaminant	cleanup level
trichloroethylene	5 ppb
trans 1,2. dichloroethylene	70 ppb
1,1,1-trichloroethane	200 ppb
methylene chloride	5 ppb
vinyl chlorine	2 ppb

The extraction and treatment system shall be started up again if these levels are exceeded in subsequent monitoring events.

Groundwater Monitoring System and Contingency Plan

A monitoring well system consisting of wells screened in the upper aquifer and wells screened in the lower aquifer shall be installed to determine the effectiveness of this remedy, and to determine if additional contaminant plumes not identified during the RI exist at the site. To the extent practicable, existing RI wells shall be incorporated into this system.

A contingency plan shall be developed to provide further remedial action in the event that the extraction wells are not effective in containing the contaminated plumes, or drinking water or health-based standards for any contaminant are exceeded in the future.

New Production Well

A new production well shall be installed capable of producing at least 500

gallons per minute. This well shall replace the capacity of an existing production well (KIDP well A) previously shut down due to contamination and shall be located outside of the influence of the extraction well system in consultation with KIDP representatives. If possible, existing KIDP well A shall be used as an extraction well.

Asbestos Containing Structures

An asbestos assessment shall be conducted on the Two-Line Road property, One-Line Road property and National Packaging property by qualified asbestos workers. The following actions shall be taken with respect to asbestos-containing materials (ACM) on these properties:

* Building Interiors - No action
* Building Exteriors - encapsulation of friable ACM
* Materials not in or on Buildings or Structures - Removal and disposal of ACM in accordance with regulations contained in 40 CFR Part 61.

Personnel in buildings containing ACM in the interior shall be notified regarding the nature and condition of ACM in these buildings.

Potentially Buried Drums

Two areas where buried drums and/or other containers may have come to be located have been identified on KIDP and Space Leasing property. These approximate locations are indicated on Figures 13 and 14. Soil gas surveys shall be conducted in these areas and the immediate vicinity to identify potential organic contamination. Based on the results of the soil gas surveys, test pits shall be excavated to identify potentially buried drums and/or other containers.

The following actions shall be taken based on observations and findings during the excavation of the test pits:

* No drums or Containers Found- backfill test pits.
* Empty Drums or Containers Found- Crush and properly dispose of empties; perform soil sampling in vicinity of drums or containers; recommend and perform follow-up actions consistent with other portions of this ROD based on sampling results.
* Drums or Containers Found with Contents- Excavate and properly dispose of drums and/or containers; perform soil sampling in vicinity of drums or containers; recommend and perform follow-up actions consistent with Section IX of this ROD based on sampling results.

One-Line and National Packaging Removal Scoping/Action

Drums, tanks and containers located on the One-Line Facility and immediately south of the National Packaging building (see figure in Declaration for the Record of Decision) shall be inspected and sampled, and the following actions shall be taken based on the results of these inspections and sampling events:

* Empty Drums or Containers Found- Crush and properly dispose of empties; perform soil sampling in vicinity of drums or containers; recommend and perform follow-up actions consistent with other portions of this ROD based on sampling results.
* Drums or Containers Found with Contents- Excavate and properly dispose of drums and/or containers; perform soil sampling in vicinity of drums or containers; recommend and perform follow-up actions consistent with Section IX of this ROD based on sampling results.

X. STATUTORY DETERMINATIONS

Based on the information available at this time, U.S. EPA and IDEM believe this alternative satisfies statutory requirements to: protect human health and the environment; attain ARARs, be cost-effective; and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.

Protectiveness

The selected remedy will be protective to both human health and the environment by completely and permanently treating or immobilizing all contaminated wastes. Excavation and on-site incineration of the semivolatile and PCB areas will permanently treat and eliminate contamination. Any possible RCRA characteristic waste that may remain in the form of incinerator ash will be tested and disposed of in an approved landfill. Groundwater extraction, treatment and reinjection would contain, treat and eliminate the offsite migration of groundwater contamination. The disposal of friable and damaged Asbestos Containing Material (ACM) which is located outside the site buildings would eliminate direct contact and inhalation risks to human health. The installation of an additional monitoring well system will determine the effectiveness of the remedy. An associated contingency plan would be developed to provide further remedial action in the event that the extraction wells are not effective in containing the contaminated groundwater.

Attainment of Applicable or Relevant and Appropriate Requirements

The Superfund Amendments and Reauthorization Act (SARA) requires that remedial actions meet legally applicable or relevant and appropriate requirements of other environmental laws. These laws may include: the Toxic Substances Control Act, the Safe Drinking Water Act, the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act (RCRA), and any state law which has stricter requirements than the corresponding federal law.

* RCRA Subtitle C Incinerator

The State of Indiana has jurisdiction for RCRA Subtitle C, hazardous waste incinerator operation laws. These standards are for owners and operators of Hazardous Waste Treatment, Storage and Disposal Facilities and specifically applies to owners and operators of hazardous waste incinerators. The regulation seeks to minimize toxic incinerator emissions and ensure proper

disposal of incinerator ash. The incinerator would have to meet the testing and performance standards in 40 CFR 264.341, 264.351, 264.343, 264.342, 7611.70 and special State of Indiana requirements, including a test burn and extensive stack sampling.

* Groundwater Contingency Plan Action Levels

Action levels for the Groundwater Contingency Plan shall be adopted from the Maximum Contaminant Levels (MCLs) and Maximum Contaminant Level Goals (MCLGs) established under the Safe Drinking Water Act, and the appropriate State of Indiana Water Quality Standards. Groundwater contingency plans will be triggered if concentrations of contaminants in the groundwater exceed action levels at the points of compliance.

* Soil Excavation Cleanup Levels

Due to the situation that, with the exception of PCBs, there are no promulgated soil cleanup standards, soil excavation cleanup levels have been determined by TBC criteria at the Fisher-Calo site. Soil excavation will be contingent on acquiring maximum PCB levels of 10 ppm, maximum bis(2-ethylhexyl) phthalate concentrations of 5.4 ppm, and maximum isophorone concentrations of 18 ppb.

* Asbestos Cleanup Standards

Asbestos removal is governed by the National Emission Standards for Hazardous Air Pollutants, 40 C.F.R. Part 61, Subpart M. All asbestos encapsulation, removal and disposal shall be in accordance with NESHAP requirements.

Cost Effectiveness

The selected remedy is cost effective in that it addresses the principle threats using treatment to the maximum extent practicable at a cost that is proportionate to the protection provided. The cost is roughly 1 to 2 times the cost of alternatives which provide the same degree of protection but do not utilize treatment and permanent solutions to the same degree to reduce toxicity, mobility, and volume. The cost is 3 to 6 times less than that of alternatives which provide the same degree of protection, but deal with a much greater amount of contaminated soil in order to reduce the time required for ground water extraction, and, thereby, are not cost effective.

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

The selected remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. The remedy would permanently remove and treat contamination from groundwater and soils, precisely those areas where maximum human exposure would occur. The groundwater pump and treatment system would eliminate contamination from the underlying aquifer, and the site incinerator would eliminate contamination from the soils.

Preference for Treatment as a Principle Element

The selected remedy satisfies the statutory preference for remedies that employ treatment that achieves substantial risk reduction through containment and elimination of groundwater contamination, and elimination of soil contamination.

TABLE 1

REMEDIAL ACTION ALTERNATIVES

GENERAL RESPONSE ACTION			1 No Action	2 Source Containment GW Collection Discharge	3 In-Situ Stabilization GW Collection Treatment Reinjection Bioremediation	4 Limited Excavation Incineration GW Collection Treatment Discharge	5 Limited Excavation Onsite Landfill GW Collection Treatment Discharge	6 Extensive Excavation Soil Wash, Landfill GW Collection Treatment Discharge	7 Extensive Excavation Incineration GW Collection Treatment Discharge	8 Extensive Excavation Offsite Landfill GW Collection Treatment Discharge
Medium	Technology Type	Area or Volume (1)								
Soil	Capping	All Areas		•						
	Excavation	All Areas						•	•	•
		Groundwater Source Areas & PCB Areas				•	•			
	In-situ Fixation/ Stabilization	Groundwater Source Areas & PCB Areas			•					
	Soil Washing	All Areas						•		
	Onsite RCRA Landfill	All Areas					•	Soil Wash Residuals •	Inorganic & • Non-Delisted Soils	
	Offsite RCRA Landfill	All Areas								•
	Incineration	All Areas				•			•	
Groundwater	Monitoring			•	•	•	•	•	•	•
	Install New Water Supply Well			•	•	•	•	•	•	•
	Pump & Discharge			•						
	Pump & Treat Reinjection Bioremediation				•					
	Pump & Treat Discharge					•	•	•	•	•
Existing Structures (2) (Asbestos)	Assessment & Limited Removal, Repair, O&M			•	•	•	•			
	Assessment and Complete Removal							•	•	•
Space Leasing & KIDP Properties	Soil Gas Testing Test Pits, Follow-up			•	•	•	•	•	•	•

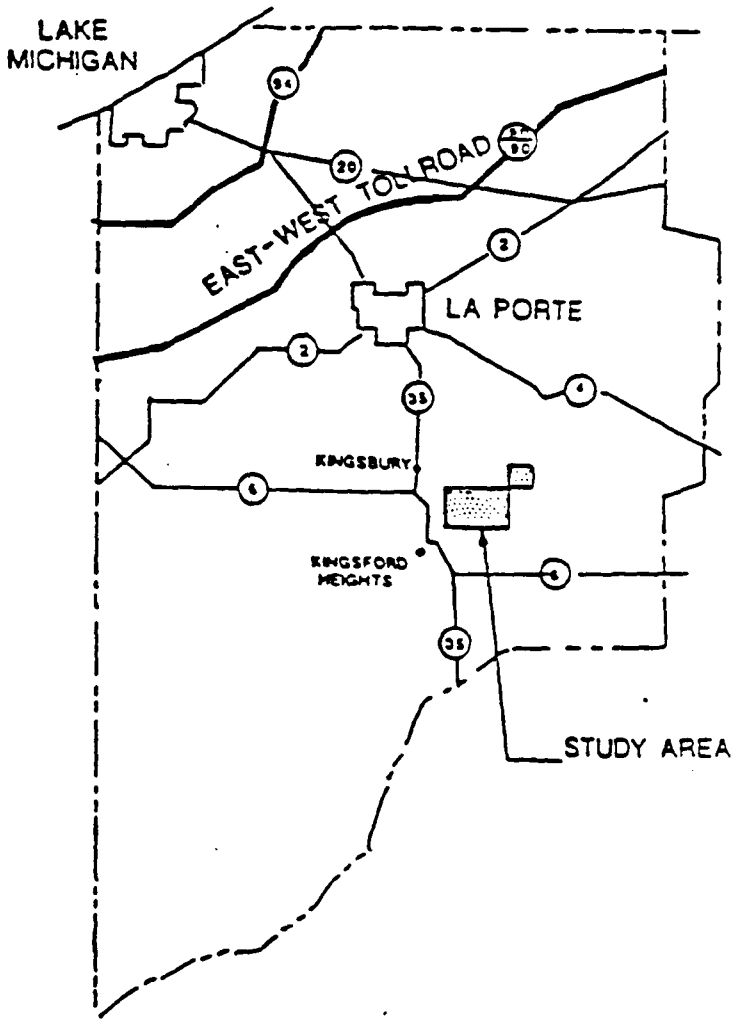
NOTES: (1) "All Areas" = 230,000 c.y., "Groundwater Source Areas & PCB Areas" = 30,500 c.y.
Refer to Section 2.3 for precise definitions of each area.

(2) Assumes all existing tanks, drums and other containers at the One-Line and Two-Line Properties will be completely remediated under sepa ctions.

TABLE 2.
COST SUMMARY OF ALTERNATIVES
IN PRESENT WORTH DOLLARS

ALTERNATIVES	Capital Cost	Annual O&M Cost	Total Present Worth
ALTERNATIVE 1: No Action	$0	$0	$0
ALTERNATIVE 2: Source Containment, Groundwater Collection and Discharge to Travis Ditch	$6,449,000	$7,057,000	$13,506,000
ALTERNATIVE 3: In-situ Stabilization, Groundwater Collection, Treatment, Reinjection and Bioremediation	$6,553,000	$10,013,000	$16,566,000
ALTERNATIVE 4: Limited Excavation, Incineration, Groundwater Collection, Treatment and Discharge to Travis Ditch	$22,306,000	$9,379,000	$31,685,000
ALTERNATIVE 5: Limited Excavation, Onsite Landfill, Groundwater Collection, Treatment and Discharge to Travis Ditch	$28,611,000	$1,158,000	$29,769,000
ALTERNATIVE 6: Extensive Excavation, Soil Washing, Groundwater Collection, Treatment and Discharge to Travis Ditch	$73,624,000	$26,250,000	$99,874,000
ALTERNATIVE 7: Extensive Excavation, Incineration, Groundwater Collection, Treatment and Discharge to Travis Ditch	$137,449,000	$8,434,000	$145,883,000
ALTERNATIVE 8: Extensive Excavation, Offsite Landfill, Groundwater Collection, Treatment and Discharge to Travis Ditch	$149,095,000	$344,000	$149,439,000

Figure 1

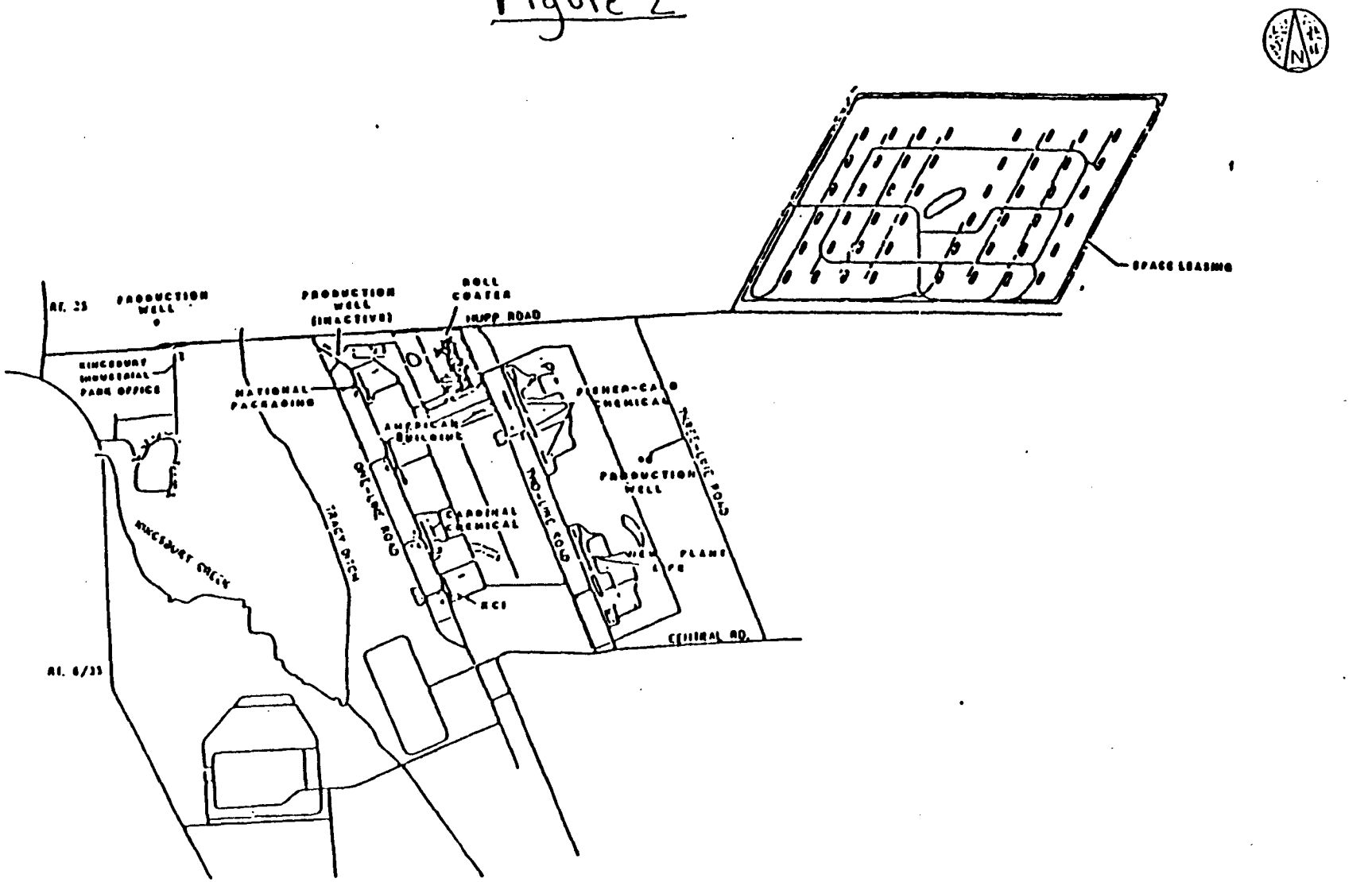


NO SCALE

SITE LOCATION MAP

FISHER-CALO
FEASIBILITY STUDY
KINGSBURY, IN.

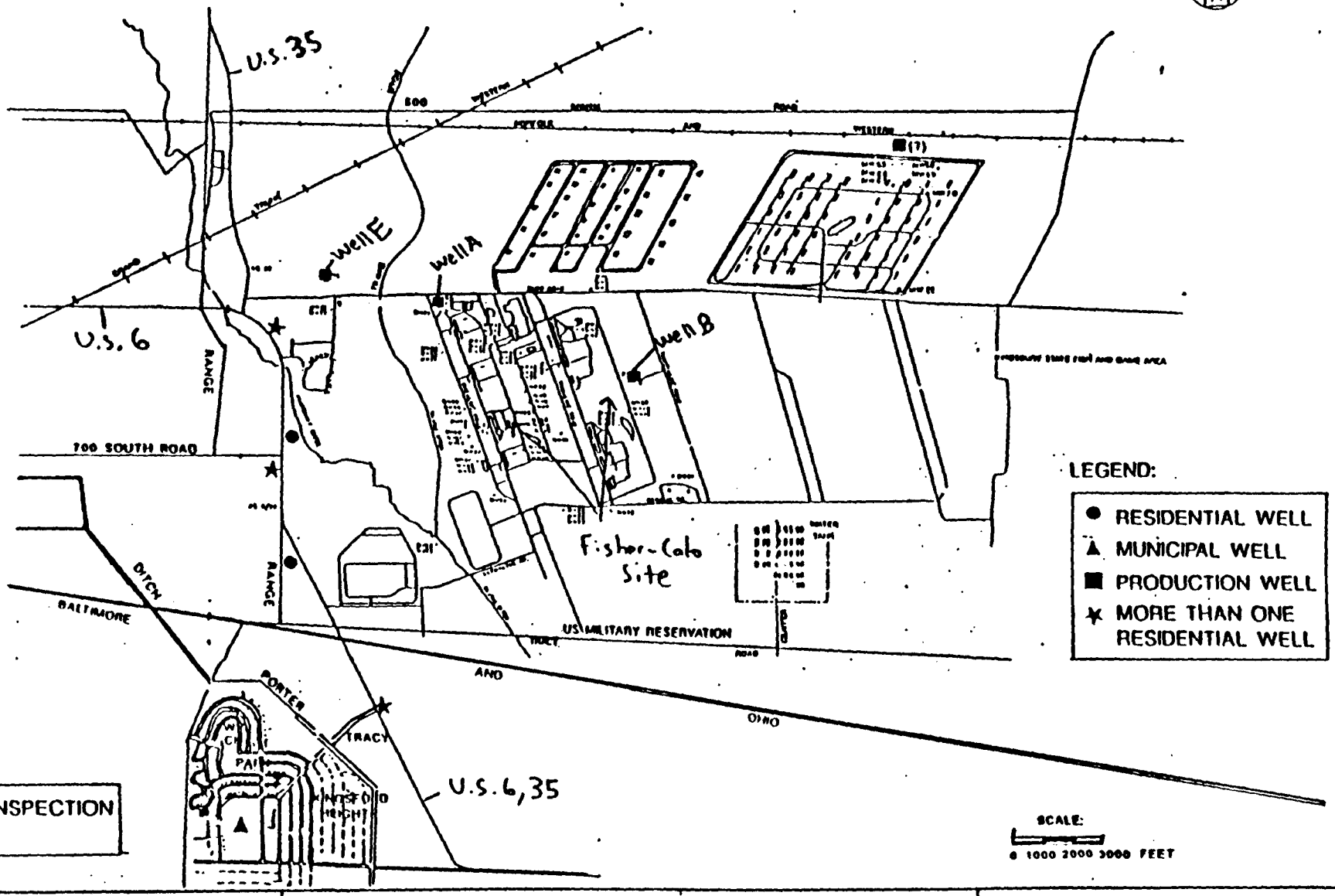
Figure 2



SITE FACILITIES MAP

FISHER-CALO
FEASIBILITY STUDY
KINGSBURY, IN.

Figure 3



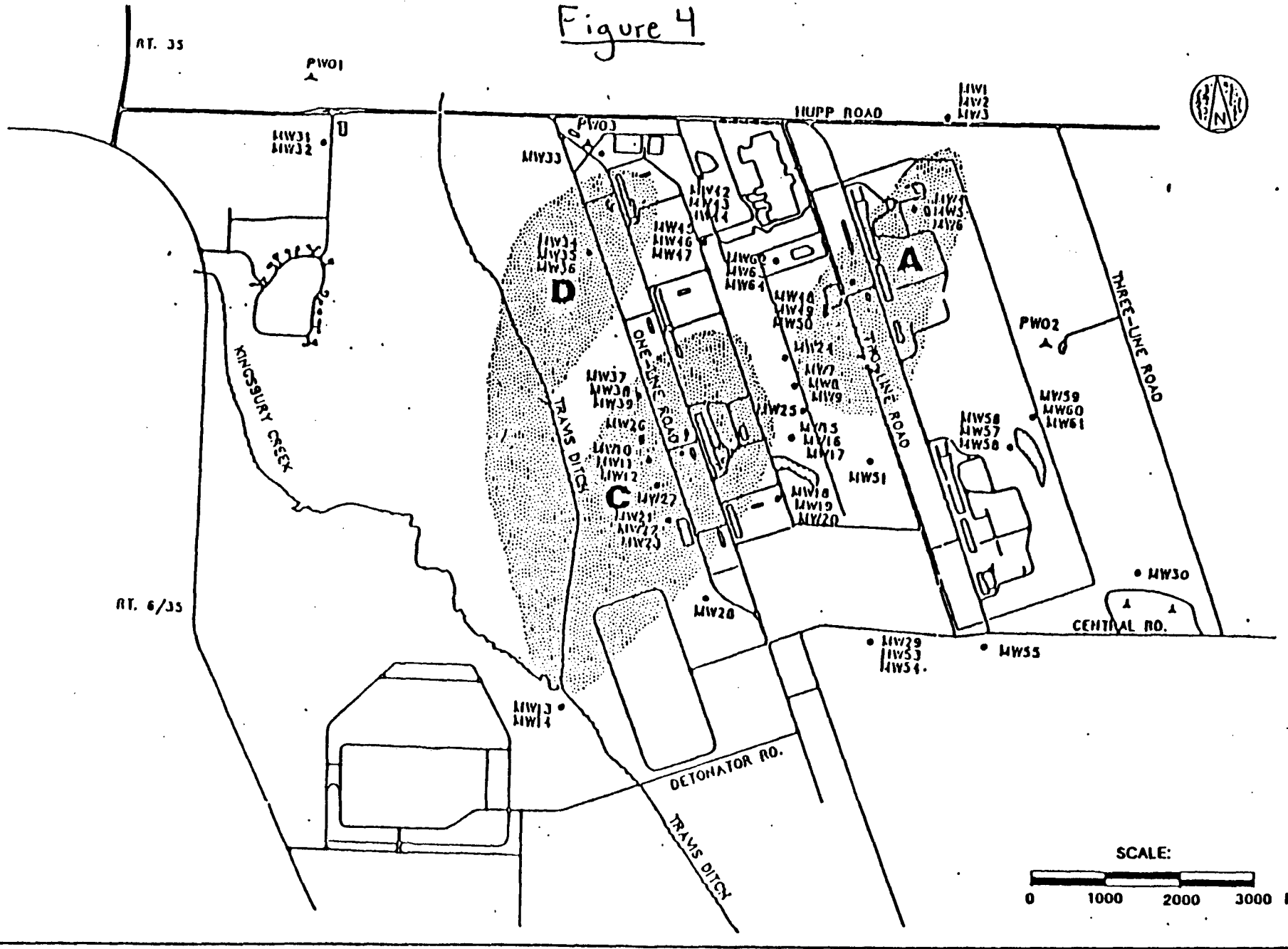
OTE:

EPA VISUAL INSPECTION
ULY 1989

PRIVATE WELLS LOCATED IN THE VICINITY OF THE FISHER-CALO SITE

FISHER-CALO
FEASIBILITY STUDY
KINGSBURY, IN.

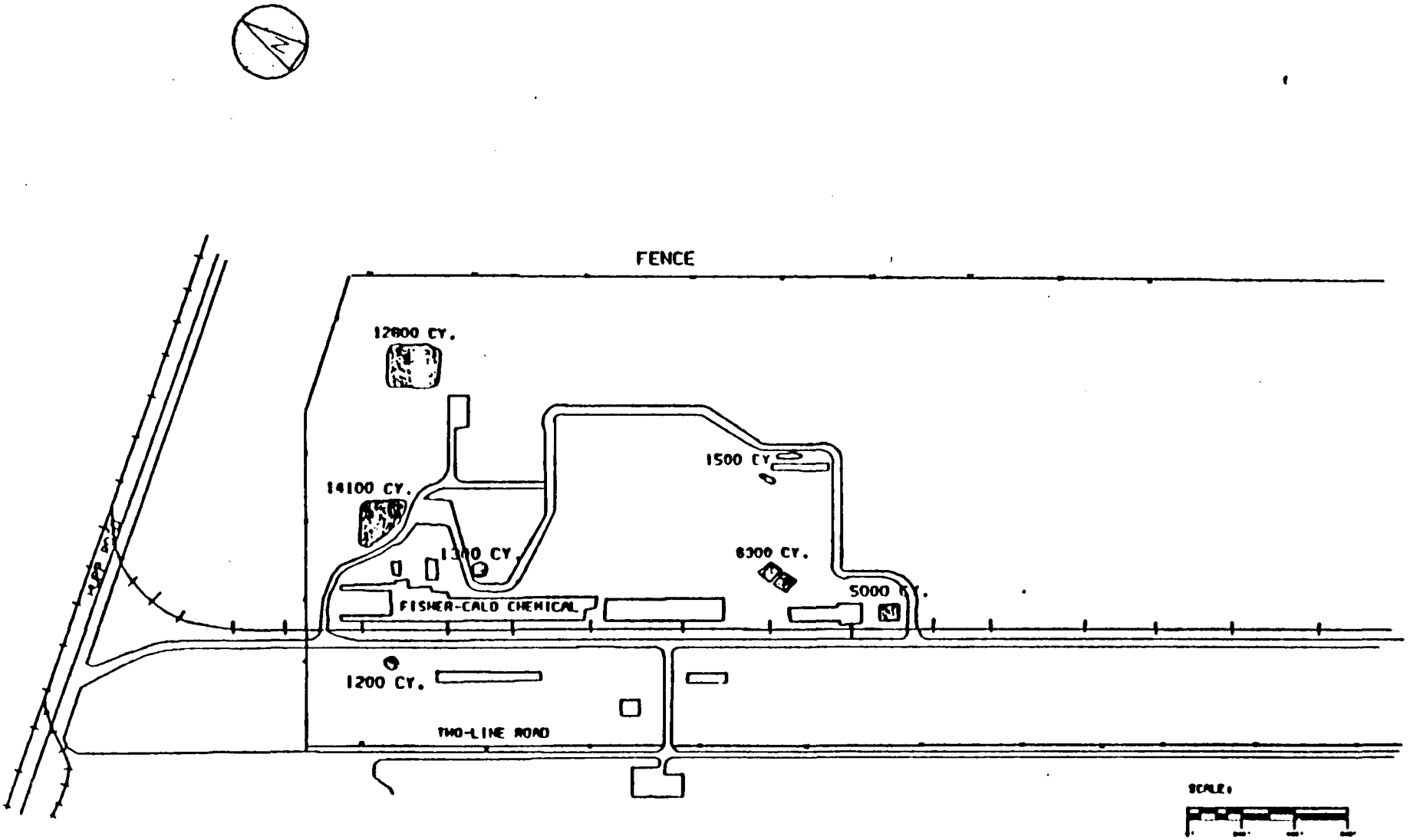
Figure 4



APPROXIMATE AREAS OF GROUNDWATER CONTAMINATION

FISHER-CALO
FEASIBILITY STUDY
KINGSBURY, IN.

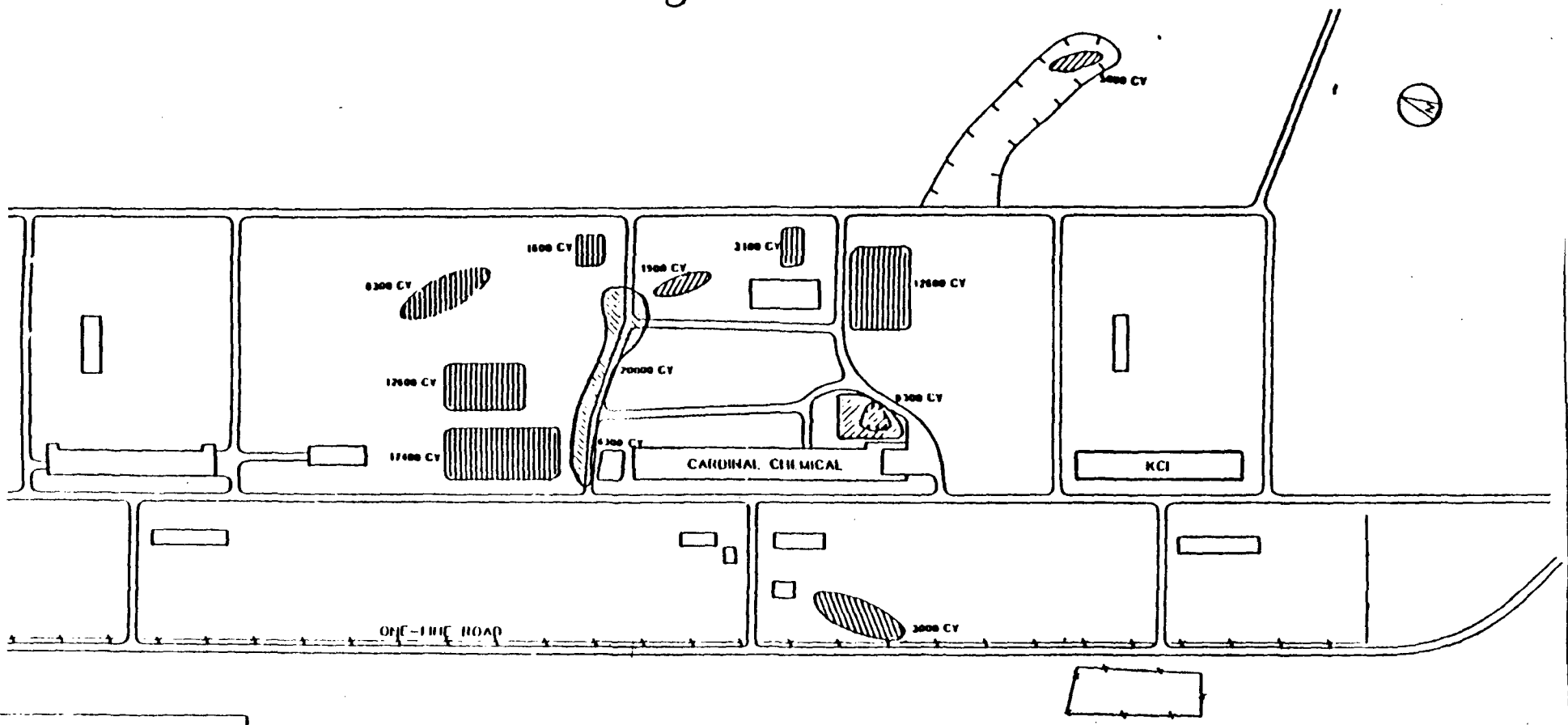
Figure 5



EXTENSIVE EXCAVATION ACTION AREAS-
North 1 of Two-Line Road Property

FIGURE 5
FISHER-CALO
FEASIBILITY STUDY
KINGSBURY, IN.

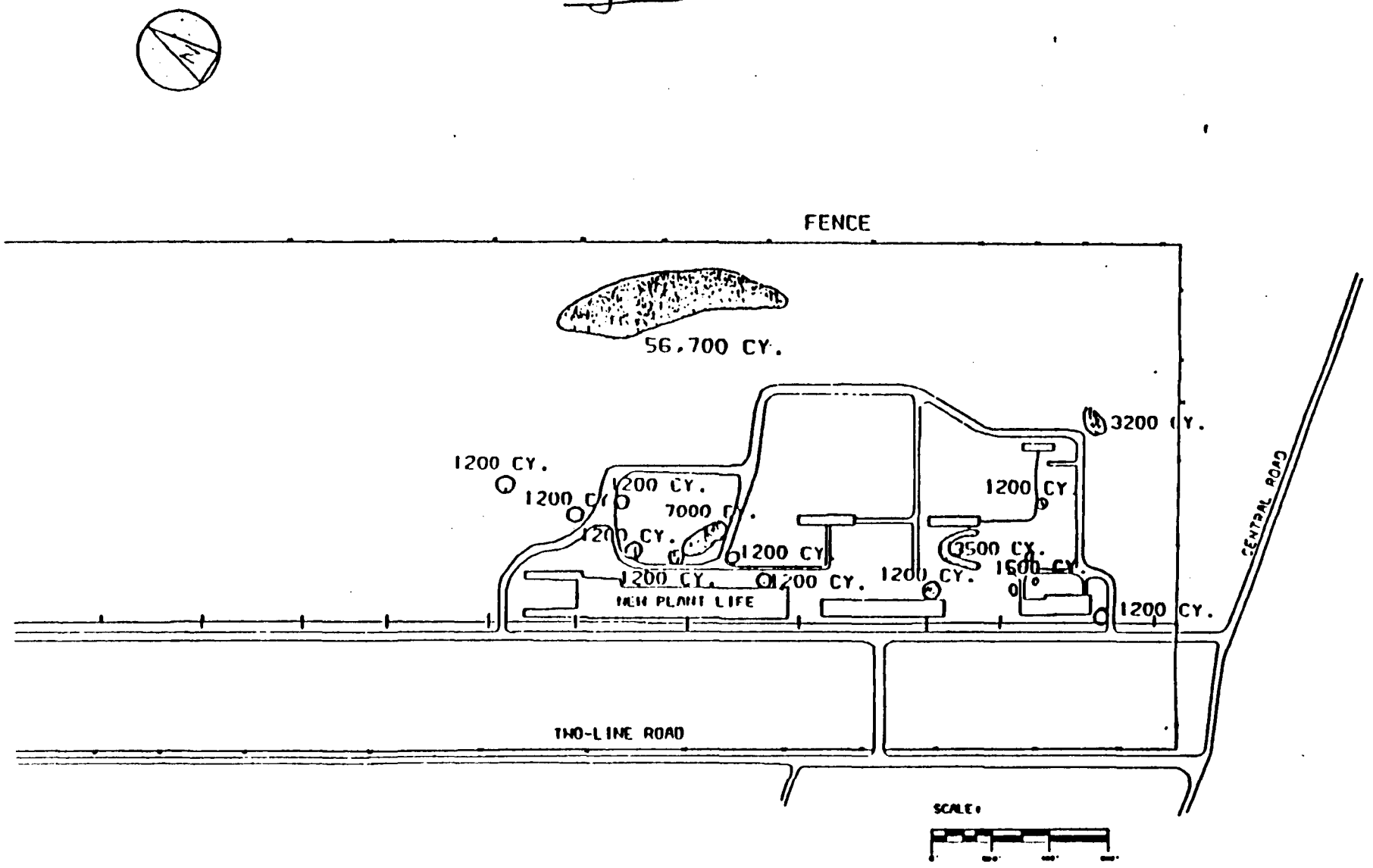
Figure 7



EXTENSIVE EXCAVATION ACTION AREAS.
Cardinal Chemical Property

FISHER-CALO
FEASIBILITY STUDY
KINGSBURY, IN.

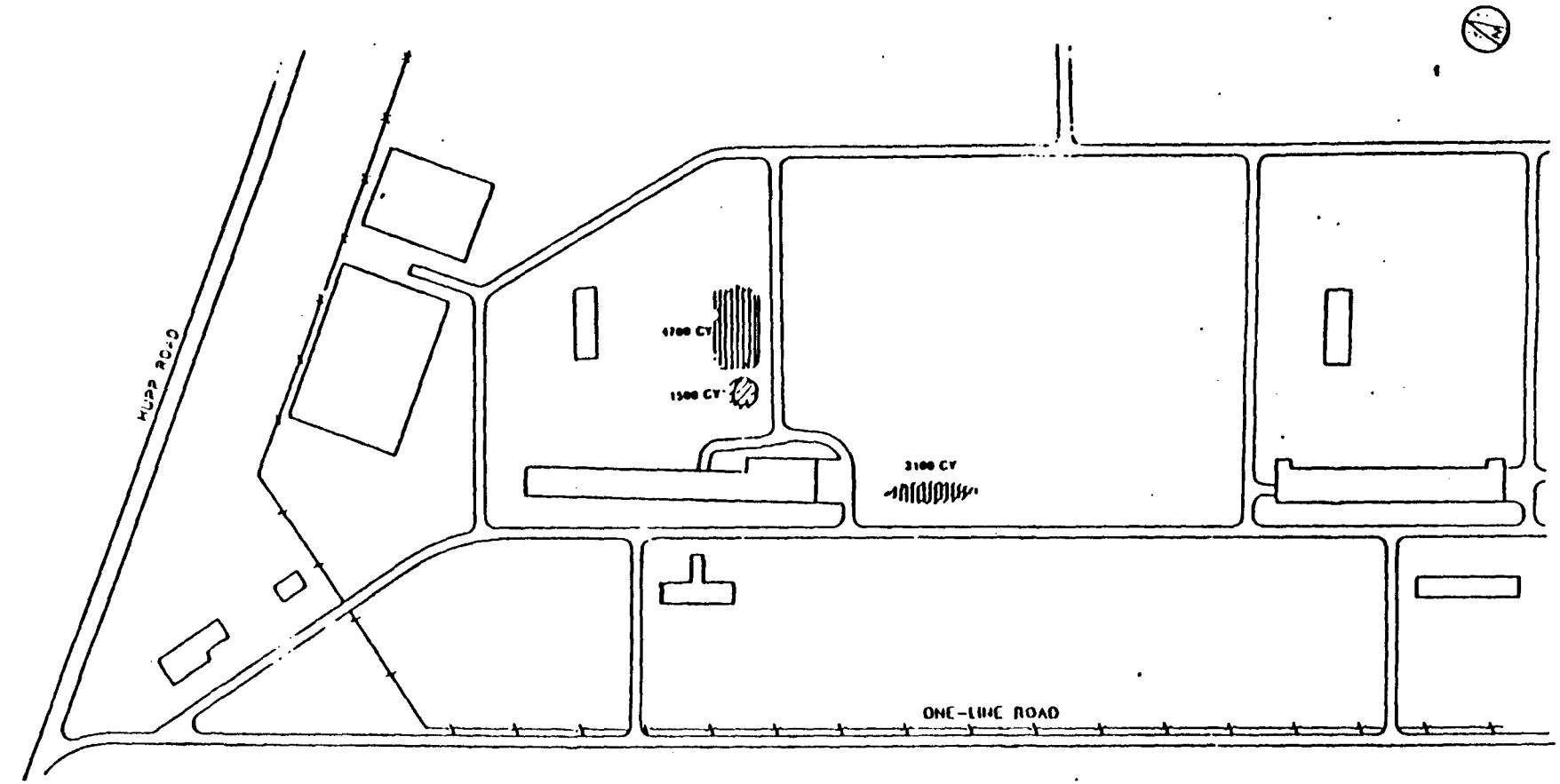
Figure 6



EXTENSIVE EXCAVATION ACTION AREAS-
South End Two-Line Road Property

FIGURE 6
FISHER-CALO
FEASIBILITY STUDY
KINGSBURY, IN.

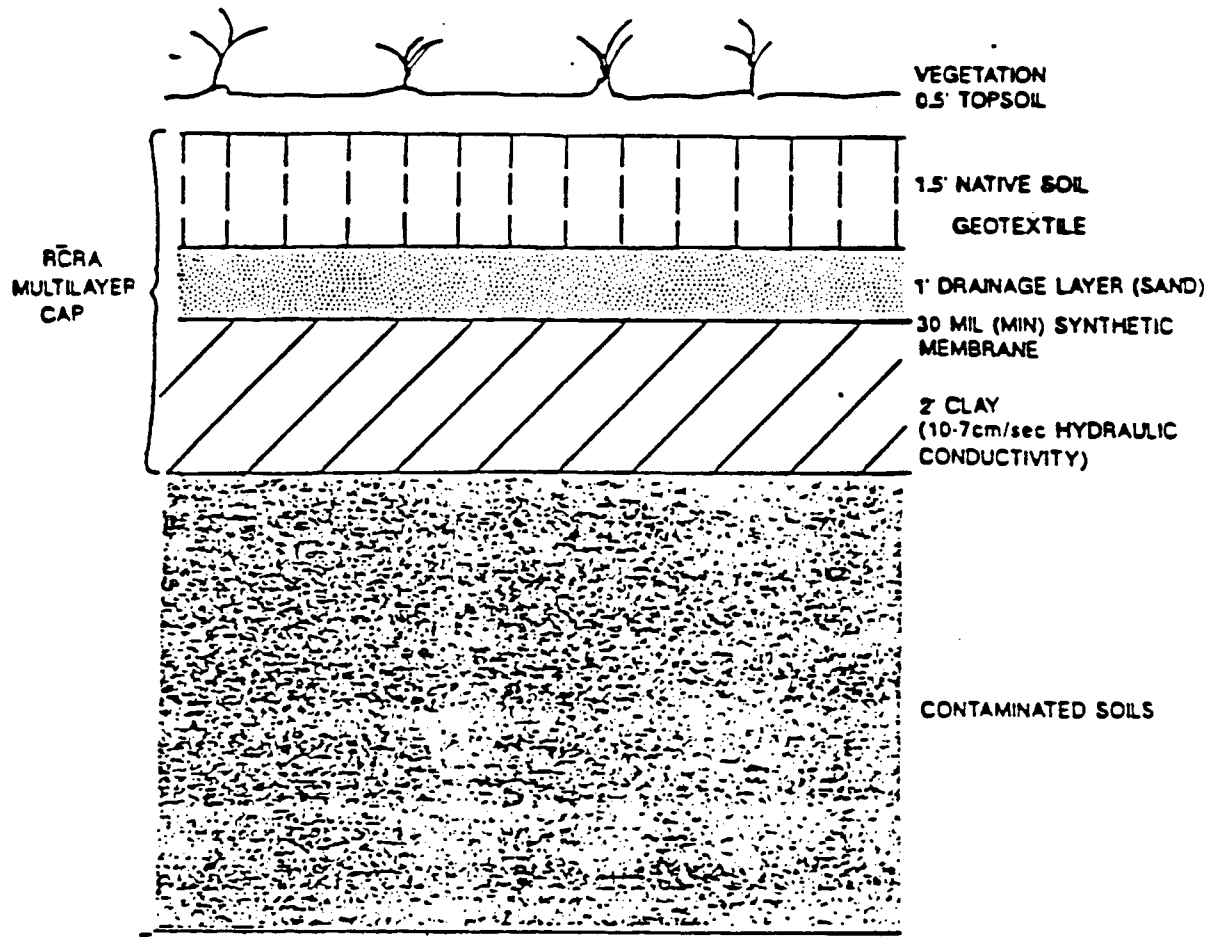
Figure 8



EXTENSIVE EXCAVATION ACTION AREAS-
National Packaging Property

FISHER-CALO
FEASIBILITY STUDY
KINGSBURY, IN.

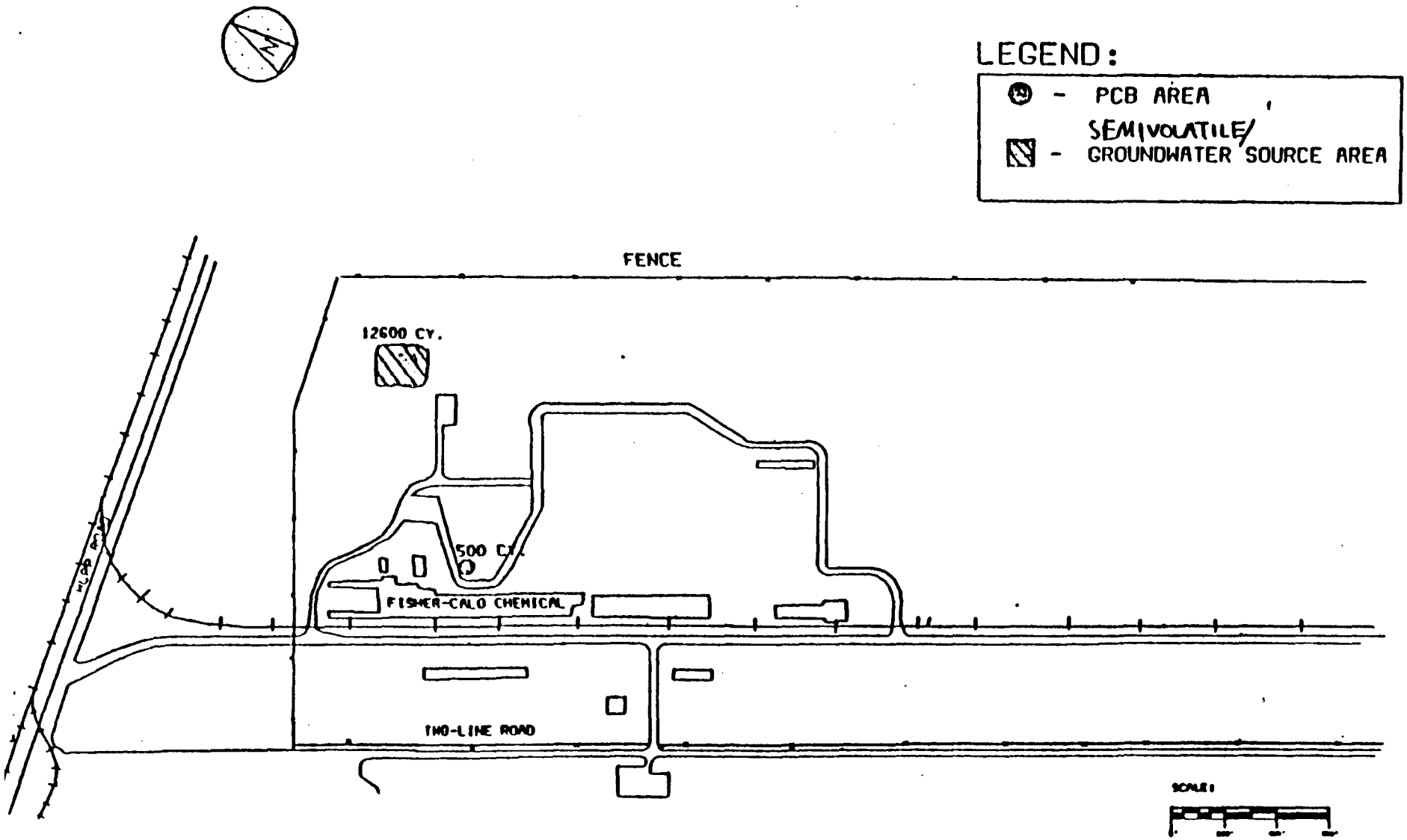
Figure 9



CROSS SECTION OF MULTIMEDIA RCRA CAP

FISHER-CALO
FEASIBILITY STUDY

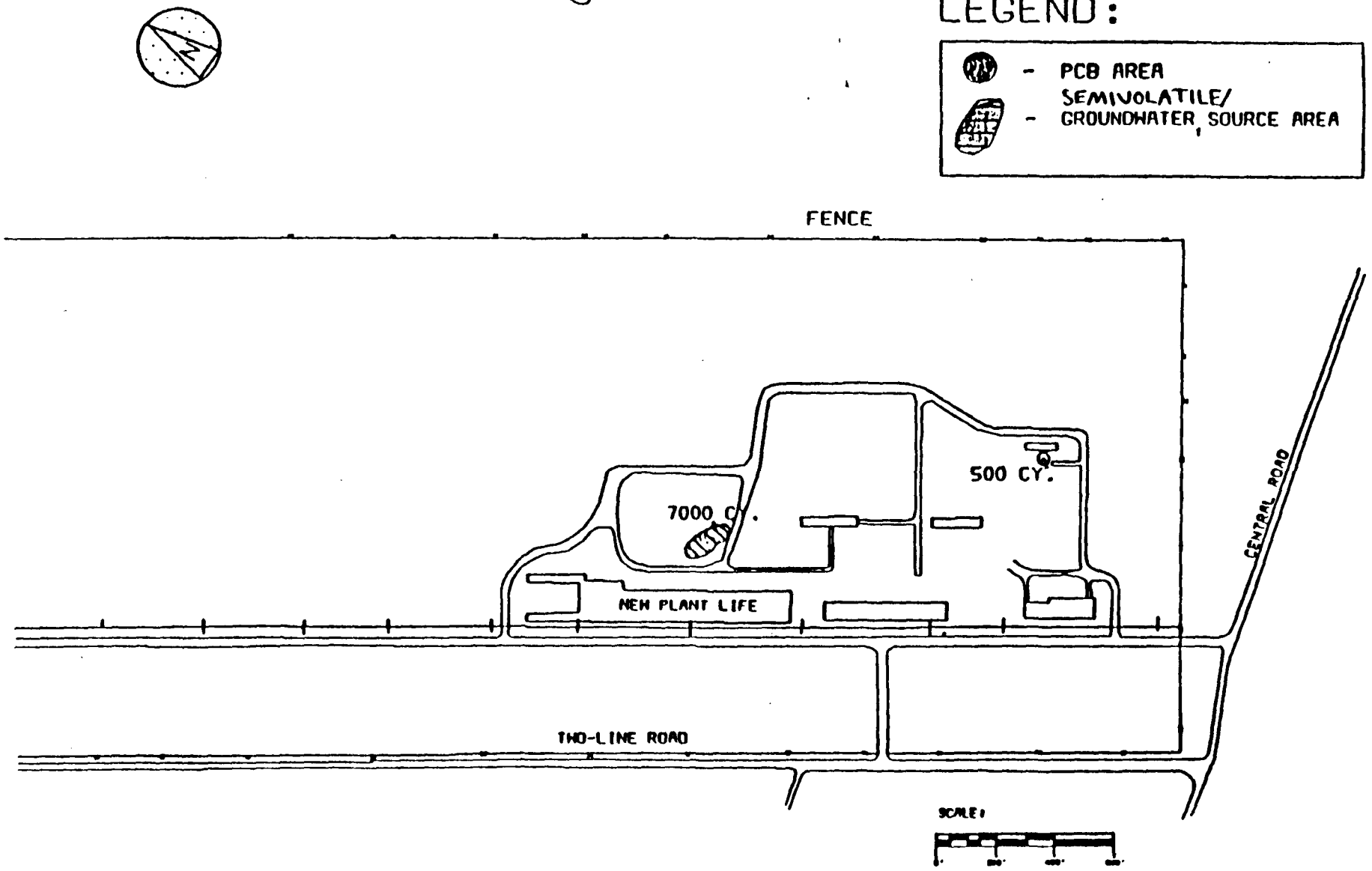
Figure 10



GROUNDWATER SOURCE & PCB EXCAVATION ACTION AREAS-
North End Two-Line Road Property

FIGURE 10
FISHER-CALO
FEASIBILITY STUDY
KINGSBURY, IN.

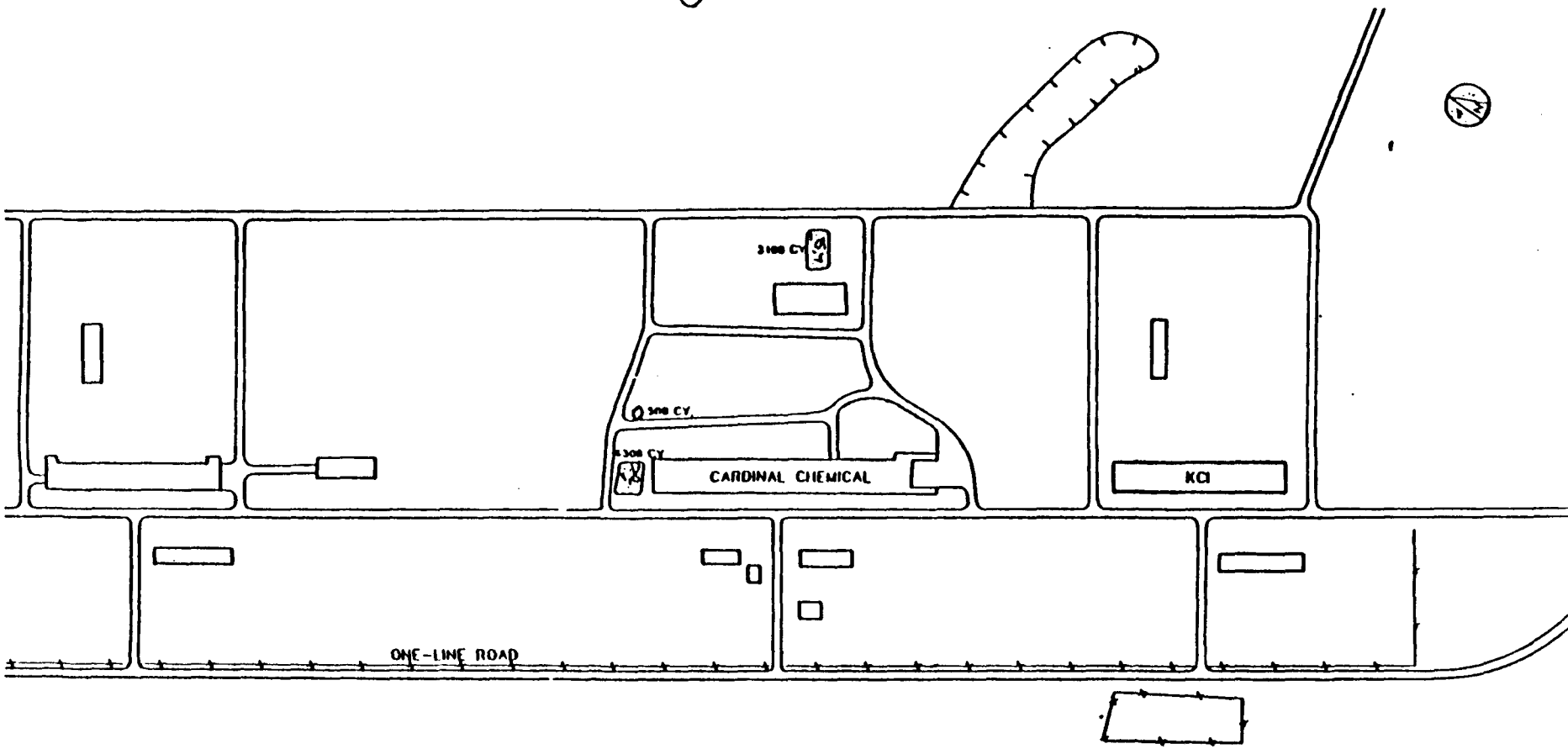
Figure 11



ROUNDWATER SOURCE & PCB EXCAVATION ACTION AREAS-
outh End Two-Line Road Property

FIGURE 11
FISHER-CALO
FEASIBILITY STUDY
KINGSBURY, IN.

Figure 12



LEGEND:

- PCB AREA
- GROUNDWATER SOURCE AREA

Scale: 0' 200' 400' 600'

SEMIVOLATILE/
GROUNDWATER SOURCE & PCB EXCAVATION ACTION AREAS -
Cardinal Chemical Property

FISHER-CALO
FEASIBILITY STUDY
KINGSBURY, IN.

Figure 13
Location of Potentially Buried Drums
KIDP Property

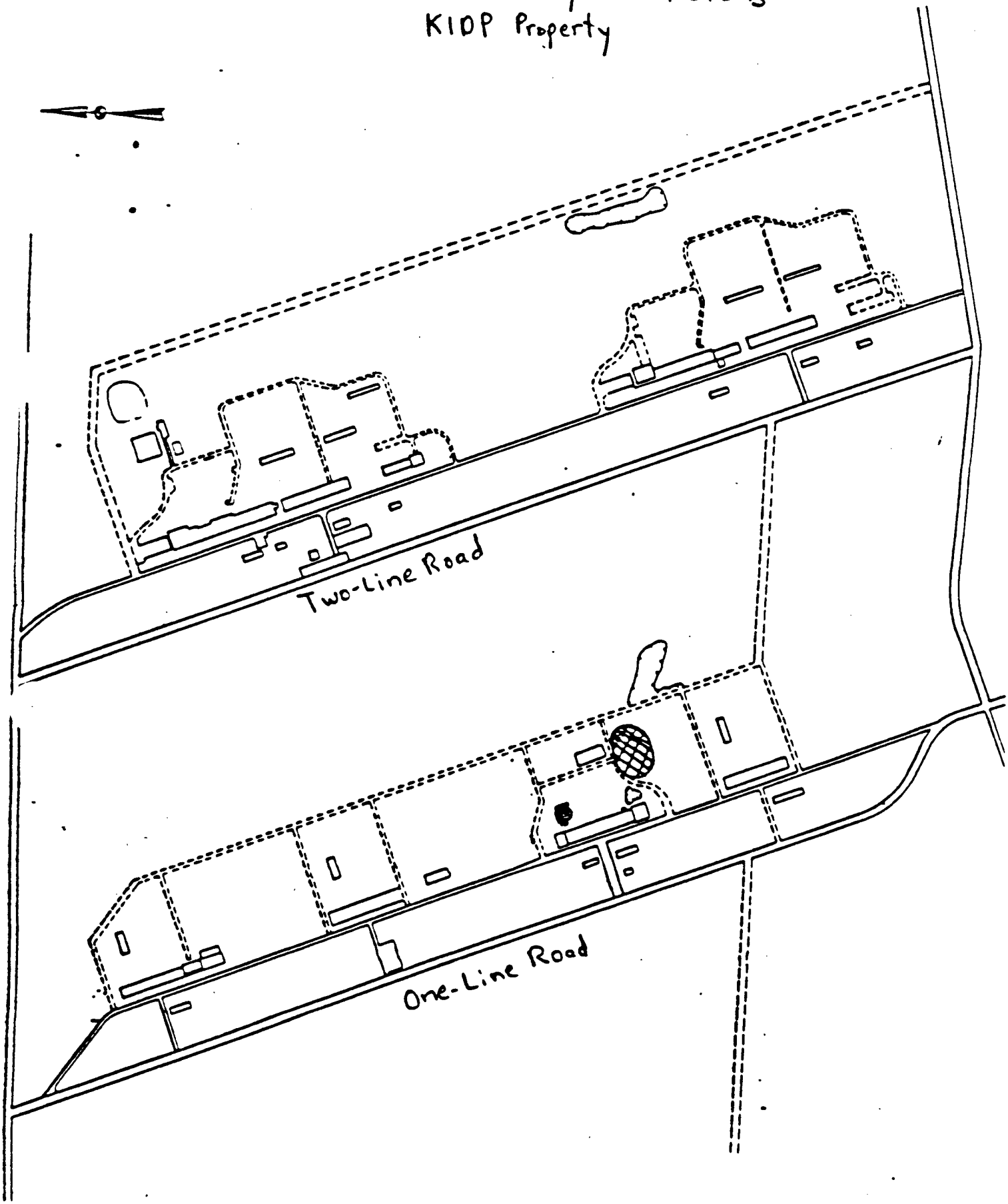
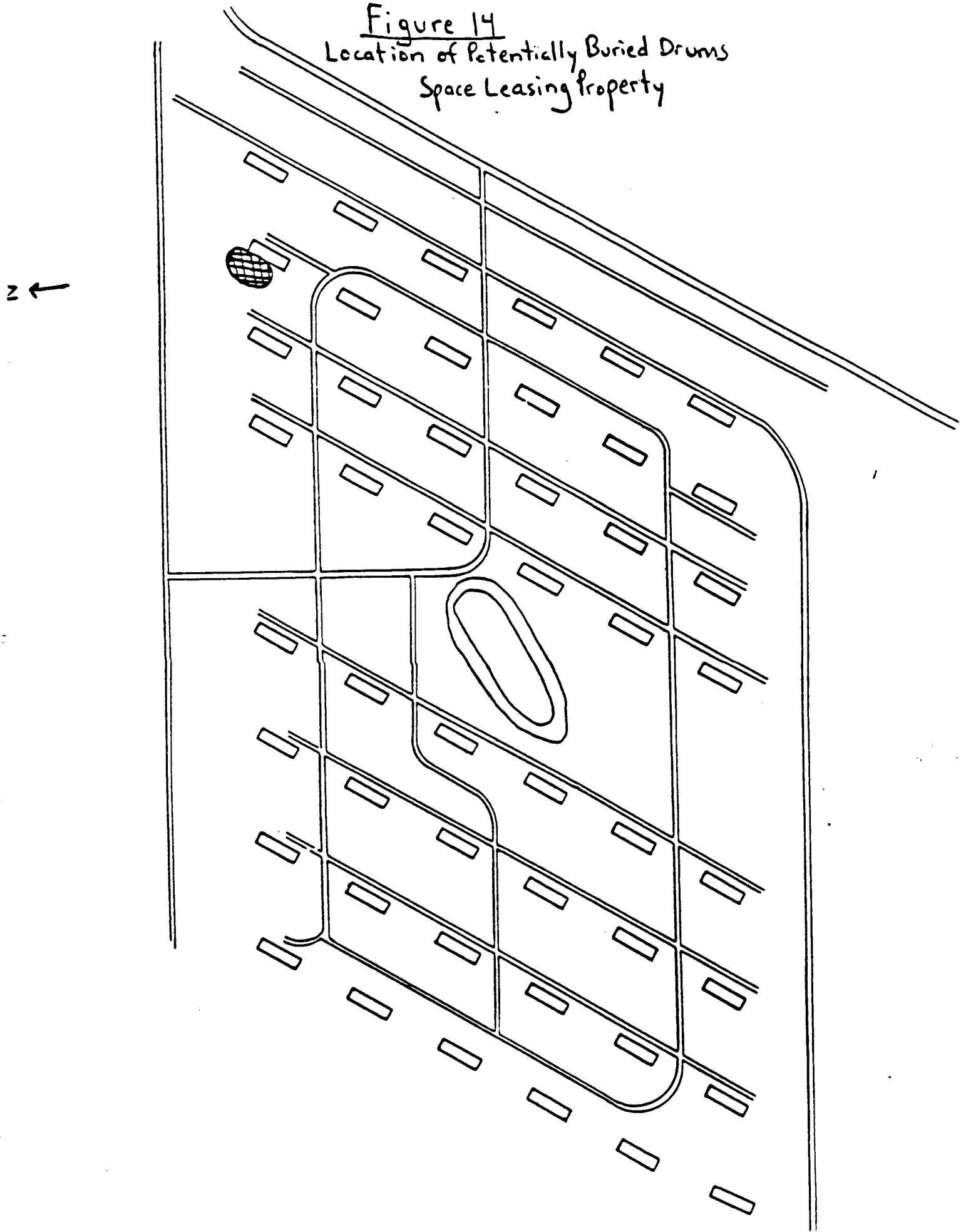


Figure 14
Location of Potentially Buried Drums
Space Leasing Property



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FINAL

NAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
	12	86/08/28	Letter re: Attached is the finalized access information	D.Buss-Dresser McKee	B.Bradley-USEPA	Correspondence	1
	3	86/12/23	Letter re: Response to discussion on 12/11/86 approval to CDM to perform EM surveys	B.Bradley-USEPA	D.Buss-Dresser & McKee	Correspondence	2
		87/01/13	Letter re: Geophysical Survey at Fisher-Calo Chemical Solvents Sites	D. Buss - Camp Dresser & McKee	B.Bradley-USEPA	Correspondence	3
	2	87/01/14	Letter re: Letter will serve as documentation of the intent to add a Phase II Study to Fisher-Calo Work Plan	D.Buss-Camp Dresser & McKee	B.Bradley-USEPA	Correspondence	4
	2	87/11/30	Letter re: Substitution of Monitoring Wells Installed during Phase I	J.Line, D.Buss-Camp Dresser & McKee	B. Bradley - USEPA	Correspondence	5
	3	88/01/08	Letter re: Request for a plastic key card for access to the Kingsbury Industrial Park, with letter from Gordon Etzler to Mary May re: closing of secondary roads on the Fisher-Calo property, dated 12/17/87 attached	M.May-USEPA	G.Etzler-Hoeppner,et al.	Correspondence	6
	10	88/01/21	Letter re: Putting in writing the need for access to the Fisher Trust properties for USEPA	M.May-USEPA	B.Tabler-Barnes&Thornbury	Correspondence	7
	11	88/02/03	Notice Letter re:	M.Gade-USEPA	PRPs	Correspondence	8

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FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCUMENT#
			USEPA has expended public funds to investigate the release of hazardous substances, with PREBASE Fisher-Calo Site (Waste Transaction Report #7)				
	1	88/04/11	Letter re: Comment on page 10 of the Health and Safety Plan Form	B.Bradley-USEPA	J.Line-Dresser & McKee	Correspondence	9
	1	88/04/18	Letter re: Request for EPA to locate the construction trailer of an engineering company on David Fisher's property in the Kingsbury Industrial Park has been denied	G.Etzler-Boeppner, Wagner & Evans	B.Bradley-USEPA	Correspondence	10
	1	88/04/18	Letter forwarding results of a water sample collected by IDEM for VOC analyses	A.Viere-IDEM	J.Cotton-Kingsbury Util.	Correspondence	11
	1	88/05/03	Letter forwarding a certified copy of an Order Granting Access by the USEPA and a copy of the Declaration in Support of Motion for an Intermediate Order in Aid of Access	S.Kaiser-USEPA	L.Burns-US Marshall Serv.	Correspondence	12
	1	88/05/04	Letter re: confirms conversation of 5/3/88 will file a response to the agency's information request letter.	R.Raftery-PRP	S.Kaiser-USEPA	Correspondence	13
	5	88/05/05	Letter re: Approves the March 1988 Supplemental QAPP for Phase II RI	B.Bradley-USEPA	J.Line-Dresser & McKee	Correspondence	14

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FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
			activities				
1		88/06/06	Letter re: Approval for CDM to dispose of empty drums at the Fisher-Calo	B.Bradley-USEPA	J.Line-Dresser & McKee	Correspondence	15
7		88/08/29	Letters re: regarding 6/20/88 telephone conversation enclosing information in EPA's file.	B.Bradley-USEPA	S.Crozie-Phelps Dodge	Correspondence	16
1		88/09/07	Letter re: 5/4/88 to EPA enclosing a list of PRPs.	B.Bradley-USEPA	R.Raftery-PRP	Correspondence	17
1		88/09/21	Letter re: to clear confusion over Hoover Universal PRP issue.	B.Bradley-Remedial Project Manager	R.Jusak	Correspondence	18
9		88/11/30	Modified Closure Plan Fister-Calo Chemicals and Solvents Corp.	B.Palin-USEPA	D.Fisher-Fisher-Calo	Correspondence	19
32		89/03/03	Letter re: responds to request for additional environmental information near Kingsford Heights.	R.Hedge-Indiana Department of Natural Resources	J.Line-Dresser & McKee	Correspondence	20
2		89/03/29	Letter re: Summary of meetings regarding activities and budget issues involved in completing the REM II contract	B.Bradley-USEPA	J.Line-Dresser & McKee	Correspondence	21
1		89/04/07	Letter re: Authorizes Camp Dresser & McKee	B.Bradley-USEPA	J.Line-Dresser & McKee	Correspondence	22

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/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCUMENT
			to dispose all drilling fluids from "clean" monitoring wells				
	5	89/05/11	Letter re: Submittal of Revised Work Plan	D.Favero-Black & Veatch	B.Bradley-USEPA	Correspondence	23
	2	89/05/18	Letter re: Requesting an opportunity to meet with the Steve Kaiser,Mary Gade & PRPs, to discuss the possibility of having the PRP group conduct a FS at the Fisher-Calo site	J.Kaupas-The Barker Firm	S.Kaiser-USEPA	Correspondence	24
	2	89/07/10	Letter re: response to the May 23, 1989, letter received representing one of parties for response action.	V. Adamkus-USEPA	J.Miller-Honorable	Correspondence	25
	8	89/09/26	Letter re: U.S. Dept. of the Interior revieved the Fisher-Calo site and have determined that the listed federal statutes qualify as ARARs under SARA,with a letter dated March 16, 1989 attached	D.Hudak-U.S. Dept. of the Interior	B.Bradley-USEPA	Correspondence	26
	2	89/09/28	Letter re: Under the SARA, the USEPA has been mandated to comply with State environmental standards, regulations and laws when selecting remedial action at Superfund site	V.Adamkus-USEPA	K.Prosser-IDEM	Correspondence	27
	9	89/11/07	Letter forwarding the ARARs for the Fisher-	C.Gabriel-IDEM	V.Adamkus-USEPA	Correspondence	28

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NAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCUMENT#
			Calo Superfund site with a cover letter attached				
	11	89/11/10	Letter forwarding the more detailed set of Fisher-Calo One Line Road database summaries	K.Pearer-TLI Systems	B.Bradley-USEPA	Correspondence	29
	8	89/11/13	Letter forwarding the Fisher-Calo PRP Group's suggested changes to EPA's prior 104(e) request pertaining to the Fisher-Calo sites	J.Kaspaar-The Barker Firm	B.Bradley&S.Kaiser-U SEPA	Correspondence	30
	100	89/12/19	Notice Letter re: Fisher-Calo and Solvents Corporation Site in Kingsbury,IN, with attachments forwarded to the PRPs	B.Riedergang-USEPA	PRPs	Correspondence	31
	11	90/03/09	Letter re: two letters from constituents, regarding the Fisher-Calo Superfund Site. Attachment.	J.H.Hyde	J.Kelly-Supervisor	Correspondence	32
	1	90/03/21	Letter re: 1/18/90 approval of Fisher Calo Risk Assessment	B.Bradley-USEPA	S.Anderson	Correspondence	33
	5	90/04/05	Letter re: Baseline Risk Assessment Report Fisher-Calo Site	D.Butler,J.Weinhoff, R.Olian-Sidley & Austin	B.Bradley-USEPA	Correspondence	34
	3	90/04/11	Letter re: Meeting of April 5, 1990 Baseline Risk Assess-ment Report	M.Akerbergs & J.Roetzer-Woodward-Clyde	B.Bradley-USEPA	Correspondence	35
	1	90/04/24	Letter re: Fisher-Calo, Review of Documents obtained from the EPA	L.Meyer-Vandeveer Garzia	B.Bradley-USEPA	Correspondence	36

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FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCUMENT#
			archive				
	2	90/04/30	Letter re: General comments about the Fisher-Calo site as follow-up to 4-26-90 meeting	R.Wolff-Emergency Planning Committee of LaPorte County	B.Bradley-USEPA	Correspondence	37
	2	90/05/07	Letter re: Public comments on the proposed plan for cleanup at Fisher-Calo	P.Benn-Potawatomi Audubon Society	Martin-USEPA	Correspondence	38
	1	90/05/10	Letter submitting comments on the Fisher-Calo Site Feasibility Study and Preferred Remedial Action Alternative	R.Bohland-Laporte County Health Dept.	USEPA	Correspondence	39
	2	90/06/12	Letter re: Comments on the Fisher-Calo Feasibility Study	A.Slesinger-Morton International	Bradley-USEPA	Correspondence	40
	4	90/06/12	Letter re: Comments on USEPA's preferred alternative for remedial action at Fisher-Calo	R.Bohland-LaPorte County Health Dept.	Bradley-USEPA	Correspondence	41
	38	90/06/12	Letter re: Comments on the Feasibility Study for Fisher-Calo	L.Edelman-Hercel Corp.	Martin-USEPA	Correspondence	42
	5	90/06/20	Letter re: Progress towards issurance of the Record of Decision	R.Olian-Sidley & Austin	V.Adamkus-USEPA	Correspondence	43
	1	90/06/21	Letter re: PRP group has proposed an alternative that will meet all remedial goals	R.Fraundelter President, Thiele-Engdahl	V.Adamkus-USEPA	Correspondence	44
	3	90/06/21	Letter re: Encouragement to temporarily postpone issuance of the Record of Decision	M.Rothschild-I.B. Distributors, Inc.	V.Adamkus-USEPA	Correspondence	45

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NR	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCUMENT#
	26	90/06/27	Letter re: Comments by PRP group during the June 6, 1990 PRP meeting, with attachments	S.Anderson, B & V Waste Science and Technology Corp.	B.Bradley-USEPA	Correspondence	46
	3	90/06/28	Letter re: Cost Summary for Modified Alternative Fisher-Calo Feasibility Study	S.Anderson-B & V Waste Science and Technology Corp.	Bradley-USEPA	Correspondence	47
		00/00/00	Fisher-Calo electromagnetic Survey (Areas 1A and 1B)		Fisher-Calo	Drawings/Diagrams	48
		86/07/09	Amended Phase I Surface Soil Sampling Locations	Camp Dresser & McKee	Fisher-Calo	Drawings/Diagrams	49
	1	87/06/18	Soil Samples			Drawings/Diagrams	50
	2	89/03/00	Fact Sheet re: background information for Fisher-Calo Site	USEPA	USEPA	Fact Sheets	51
	5	90/02/00	Fact Sheet re:Status at the Fisher-Calo Site	USEPA	USEPA	Fact Sheets	52
	3	86/10/06	Site Visit - Kingsbury Industrial Park	D.Buss-Camp Dresser & McKee	B.Bradley-USEPA	Memorandum	53
	2	88/05/20	Release announcing that criminal cahrges have been filed against Fisher Calo	Indiana Department of Environmental Managt	C.Lynch-IDEM	News Release	54
	9	78/07/17	Water Well Log	Bruns-Kingsbury Utilities Well A		Other	55

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	19	00/00/00	Administrative Order Pursuant to Section 106	USEPA Region V		Pleadings/Orders	56
	1	00/00/00	Risk Assessment/FS Work Plan File Handwritten		Fisher-Calo	Reports/Studies	57
	1	81/08/09	RCRA Consent Decree Monitoring Summary of Results	USEPA		Reports/Studies	58
	69	87/03/09	Geophysical Investigation	J.Bartlett, J.R. Orsic USEPA Region V	Fisher-Calo	Reports/Studies	59
	4	87/06/23	Handwritten: Preliminary Air Monitoring	Camp Dresser McKee	Fisher-Calo	Reports/Studies	60
	15	87/09/01	Fisher-Calo Chemical and Solvents Site Kingsbury, Indiana Ground Penetrating Radar Surveys September 1, 1987 April 7, 1988	USEPA	Fisher-Calo	Reports/Studies	61
	42	88/03/00	Health and Safety Plan For Phase II Remedial Investigation activities	Camp Dresser & McKee Inc.	Fisher-Calo	Reports/Studies	62
	80	88/05/05	Indiana State Board of Health Lab report of VOC results, with maps of Fisher-Calo in Kingsbury and memo dated 5/16/88 attached	ISBH	USEPA	Reports/Studies	63
	22	88/05/06	Special Analytical Services Request Phase II RI Activities	USEPA Region V	Fisher-Calo	Reports/Studies	64

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S/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCUMENT#
	66	88/05/17	Final Supplemental Quality Assurance Project Plan for Fisher-Calo	Camp Dresser & McKee Woodward-Clyde Consultants	G.Kulma B.Bradley- USEPA	Reports/Studies	65
	6	88/09/00	EPA report entitled Additional Testing Underway at the Fisher-Calo Superfund Site	USEPA Region V	USEPA	Reports/Studies	66
	3	89/01/17	Preliminary Health Assessment- Fisher Calo LaPorte	U.S. Public Health Service	Fisher-Calo LaPorte	Reports/Studies	67
	70	89/03/00	Phase 1 Work Plan	Conestoga-Rovers & Associates	Fisher-Calo Site	Reports/Studies	68
	45	89/04/00	Risk Assessment/ Feasibility Study Work Plan Assignment#13-5L13 Project # 7C230	Black & Veatch Warzyc	Fisher-Calo	Reports/Studies	69
	240	89/04/00	Remedial Investigation Report Vol. III of III	USEPA Camp Dresser & McKee; Woodard-Clyde Consultants	Fisher-Calo	Reports/Studies	70
	122	89/05/00	Remedial Investigation Report Vol. II of III	USEPA Contract No. 68-01-6939	Fisher-Calo	Reports/Studies	71
	285	89/05/00	Remedial Investigation Report Vol. 1 of 3	USEPA Contract No. 68-01-6939	Fisher-Calo	Reports/Studies	72
	13	89/06/30	Addendum to Remedial Investigation Report	USEPA Region V	Fisher-Calo	Reports/Studies	73
	15	89/08/28	Analysis of Organic Chemical Compounds by Gas Chromatography/	Suburban Laboratories, Inc.	R.Weston-Weston	Reports/Studies	74

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RANK	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
			Mass Spectrometry Final Report				
	89	89/10/00	Phase II Work Plan	Conestoga-Rovers & Associates	Fisher-Calo Site	Reports/Studies	75
	5	90/01/09	Well Sampling Results for Fisher-Calo Kingsbury, Indiana	Weston/RET		Reports/Studies	76
	150	90/01/17	Revised Baseline Risk Assessment Report	S. Anderson - B&V Waste Science and Technology Corp.	Fisher-Calo	Reports/Studies	77
	50	90/02/07	Review Of The Remedial Investigation For The Fisher- Calo Chemical Site	Woodward-Clyde Consultants	Fisher-Calo	Reports/Studies	78
	425	90/04/00	Feasibility Study Work Assignment No. 13-5L13	Black & Veatch Varzyn	Fisher-Calo	Reports/Studies	79
	8	90/04/00	RFA-Feasibility Study Completed RFA Issues Proposed Plan	USEPA	USEPA	Reports/Studies	80
	33	90/04/13	Proposed Plan for the Fisher-Calo Site Kingsbury, Indiana	USEPA		Reports/Studies	81
	8	90/05/23	Work Plan Community Relations Fisher-Calo Superfund Site Kingsbury, Indiana	Black & Veatch Varzyn Engineering	USEPA-Region V	Reports/Studies	82
	68	90/06/13	Review of the FS for the Fisher-Calo Chemical Site Kingsbury, Indiana	Woodward-Clyde Consultants	Fisher-Calo PRP Group	Reports/Studies	83

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80	90/04/26	Transcript of proceedings from 4-26-90 public meeting	Sauer, Court Reporter	USEPA	Transcript	84

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Guidance Documents not copied, may be reviewed at
USEPA Region V-Chicago IL

TITLE	AUTHOR	DATE
USEPA Interim Guidance on Compliance with Applicable State and Federal CERCLA Requirements for Remedial Action	USEPA	00/00/00
USEPA Fact Sheet, Toxic Chemicals: What They Are, How They Affect You;	USEPA	00/00/00
EPA Journal, "Superfund: Looking Back, Ahead";	EPA	00/00/00
USEPA Fact Sheet, Superfund;	USEPA	00/00/00
USEPA Fact Sheet, State and Local Involvement in the Superfund Program;	USEPA	00/00/00
USEPA Fact Sheet, Public Involvement in the Superfund Program;	USEPA	00/00/00
USEPA Pamphlet, The New Superfund: What It Is, How It Works;	USEPA	00/00/00
USEPA Pamphlet, Protecting Our Groundwater: A Grower's Guide;	USEPA	00/00/00
USEPA Pamphlet, Your Guide to the U.S. EPA;	USEPA	00/00/00
Superfund Amendments and Reauthorization Act of 1986.	EPA	00/00/00

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COMPENDIUM OF CERCLA RESPONSE SELECTION GUIDANCE DOCUMENTS

DOC NO	VOL	TITLE	DATE	AUTHORS	STATUS	PAGES	TIER	ATTACHMENTS	OSWER/EPA NO
0000	1	INDEX TO COMPENDIUM OF CERCLA RESPONSE SELECTION GUIDANCE DOCUMENTS	05/01/89	- OWPE - PRC ENVIRONMENTAL MANAGEMENT, INC	Final	8		1) DATA ELEMENT DEFINITIONS 2) ORGANIZATIONAL ABBREVIATIONS AND ACRONYMS IDENTIFIED IN INDEX	
**		Pre-Remedial							
0001	1	EXPANDED SITE INSPECTION TRANSITIONAL GUIDANCE FOR FY-88	10/01/87	- OSWER	Final	34	2		OSWER #9345
0002	1	PRELIMINARY ASSESSMENT GUIDANCE FISCAL YEAR 1988	01/01/88	- OSWER/OECD	Final	83	2		OSWER #9345
**		Removal Action							
1000	1	CERCLA REMOVAL ACTIONS AT MIXTURE RELEASE SITES	01/23/86	- LONDEST, H.L. /OSWER	Final	2	2		OSWER #9360
1001	1	COSTS OF REMEDIAL RESPONSE ACTIONS AT UNCONTROLLED HAZARDOUS WASTE SITES	01/01/81	- RIEGEL, M.L., ET AL /SCS ENGINEERS - ALDRICH, D.W. /HERL	Final	164	1		
1002	1	EMERGENCY RESPONSE PROCEDURES FOR CONTROL OF HAZARDOUS SUBSTANCE RELEASES	01/01/83	- MELVOLD, R.W. /ROCKWELL INTERNATIONAL - MCCARTHY, L.T. /HERL	Final	33	1		EPA-600/D-8
1003	1	ENVIRONMENTAL REVIEW REQUIREMENTS FOR REMOVAL ACTIONS	04/13/87	- OSWER/OERR	Final	6	2		OSWER #9316
1004	1	GUIDANCE ON IMPLEMENTATION OF THE "CONTRIBUTE TO REMEDIAL PERFORMANCE" PROVISION	04/06/87	- OSWER	Final	6	2		OSWER #9360
1010	2	GUIDANCE ON NON-NPL REMOVAL ACTIONS INVOLVING NATIONALLY SIGNIFICANT OR PRECEDENT SETTING ISSUES	04/01/89	- LONDEST, H.L. /OERR	Final	9	2	1) REQUEST FOR CONCURRENCE	OSWER #9360
1005	1	INFORMATION ON DRINKING WATER ACTION LEVELS	04/19/88	- FIELDS, JR., T /OSWER/OERR	Final	17	2	1) MEMO RELEASES FROM LAWFULLY APPLIED PESTICIDES 2) MEMO DBCP CONTAMINATION 3) GUIDANCE FOR ETHYLENE DIBROMIDE IN DRINKING H2O	
1006	1	SUPERFUND REMOVAL PROCEDURES, REVISION #3	03/01/88	- OSWER/OERR	Final	365	1		OSWER #9360
1007	1	THE ROLE OF EXPEDITED RESPONSE ACTIONS UNDER SARA	04/23/87	- LONDEST, H.L. /OERR	Final	3	2		OSWER #9360
4003	36	INTERIM FINAL GUIDANCE ON REMOVAL ACTION LEVELS AT CONTAMINATED DRINKING WATER SITES (Secondary Reference)	10/06/87	- OSWER/OERR	Final	9	2		OSWER #9360
4031	33	REMOVAL COST MANAGEMENT MANUAL (Secondary Reference)	04/01/88	- OSWER/OERR	Final	170	1		OSWER #9360

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Doc NO	Vol	Title	Date	Authors	Status	Pages	Tier	Attachments	OSWER/EPA Number
**		RI/FS - General							
2000	2	CASE STUDIES 1-23: REMEDIAL RESPONSE AT HAZARDOUS WASTE SITES	03/01/84	- CRD/CERI/HERL - OSWER/OERR	Final	830	1		EPA 540/2-84/003B
2001	1	EPA GUIDE FOR MINIMIZING THE ADVERSE ENVIRONMENTAL EFFECTS OF CLEANUP OF UNCONTROLLED HAZARDOUS WASTE SITES	06/01/85	- ENVIRONMENTAL RESEARCH LABORATORY	Final	230	1		EPA/600/8-85/006
2002	1	GUIDANCE FOR CONDUCTING REMEDIAL INVESTIGATIONS AND FEASIBILITY STUDIES UNDER CERCLA	10/01/88	- OSWER/OERR	Final	390	1		OSWER 9355.3-01
2003	1	JOINT CORPS/EPA GUIDANCE	06/24/83	- OERR/PAS	Final	42	2		OSWER 9295.1-02
2004	4	MODELING REMEDIAL ACTIONS AT UNCONTROLLED HAZARDOUS WASTE SITES (VOL I-IV)	04/01/85	- ROSWELL, S H., ET AL /ANDERSON-NICHOLS AND CO - OSWER/OERR - AMON, D C AND ROSWELL, JR., E O /HERL	Final	350	1		OSWER 9355.0-08
2005	4	POLICY ON FLOOD PLAIN AND WETLAND ASSESSMENTS FOR CERCLA ACTIONS	08/01/85	- FREEMAN, JR., W N /OERR - LUCERO, C /OWPE	Final	9	2		OSWER 9280.0-01
2006	4	REMEDIAL RESPONSE AT HAZARDOUS WASTE SITES: SUMMARY REPORT	03/01/84	- CRD/HERL	Final	95	1		EPA 540/2-84/003A
2007	4	REVISED PROCEDURES FOR IMPLEMENTING OFF-SITE RESPONSE ACTIONS	11/13/87	- PORTER, J W /OSWER	Final	20	2		OSWER 9834.11
2008	4	RI/FS IMPROVEMENTS	07/31/87	- LONGEST, H L /OERR	Final	11	2	1) RI/FS IMPROVEMENTS	OSWER 9355.0-30
2009	4	RI/FS IMPROVEMENTS FOLLOW-UP	04/15/88	- LONGEST, H L /OERR	Final	16	2	1) RI/FS IMPROVEMENTS FOLLOW-UP 2) REMEDIAL INFORMATION TRANSFER ACTIVITIES	OSWER 9355.3-05
2010	4	SUPERFUND FEDERAL-LEAD REMEDIAL PROJECT MANAGEMENT HANDBOOK	12/01/86	- OERR	Draft	170	1		OSWER 9355.1-1
2011	5	SUPERFUND REMEDIAL DESIGN AND REMEDIAL ACTION GUIDANCE	06/01/86	- OERR	Final	100	1		OSWER 9355.0-4A
2012	5	SUPERFUND STAFF-LEAD REMEDIAL PROJECT MANAGEMENT HANDBOOK	12/01/86	- OERR	Final	120	1		OSWER 9355.1-1
**		RI/FS - RI Data Quality/Site & Waste Assessment							
2100	5	A COMPENDIUM OF SUPERFUND FIELD OPERATIONS METHODS	12/01/87	- OERR - OWPE	Final	550	1		OSWER 9355.0-14
2101	6	DATA QUALITY OBJECTIVES FOR REMEDIAL RESPONSE ACTIVITIES: DEVELOPMENT PROCESS	03/01/87	- CDM FEDERAL PROGRAMS CORP - OERR/OWPE	Final	150	1		OSWER 9355.0-7B

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3102	6	DATA QUALITY OBJECTIVES FOR REMEDIAL RESPONSE ACTIVITIES EXAMPLE SCENARIO RI/FS ACTIVITIES AT A SITE W/ CONTAMINATED SOILS AND GROUNDWATER	03/01/87	- CDM FEDERAL PROGRAMS CORP - CERCLA/OHPE	Final	130	1		OSWER #9355.0
3103	6	DESIGN AND DEVELOPMENT OF HAZARDOUS WASTE REACTIVITY TESTING METHODS	03/01/84	- WOLBACH, C.D., ET AL /ACUREX CORP - BARKLEY, M /MERL	Final	150	1		EPA-600/7-84-03
3104	6	FIELD SCREENING FOR ORGANIC CONTAMINANTS IN SAMPLES FROM HAZARDOUS WASTE SITES	04/03/86	- HOFFMAN, M.K., ET AL /ARLS CORP - CARTER, A /MICHIGAN DEPT OF NATURAL RESOURCES - THOMAS, T /EPA	Final	11	3	1) MEMO FIELD SCREENING FOR ORGANIC CONTAMINANTS	
3105	6	FIELD SCREENING METHODS CATALOG: USER'S GUIDE	09/01/88	- OSWER/OERR	Final	90	1		EPA/540/2-88/00
3106	6	FIELD STANDARD OPERATING PROCEDURES MANUAL #4-SITE ENTRY	01/01/85	- OSWER/OERR	Final	19	3		OSWER #9285.2-0
3107	7	FIELD STANDARD OPERATING PROCEDURES MANUAL #6-WORK ZONES	04/01/85	- OSWER/OERR	Final	19	3		OSWER #9285.2-0
3108	7	FIELD STANDARD OPERATING PROCEDURES MANUAL #8 AIR SURVEILLANCE	01/01/85	- OSWER/OERR	Final	24	3		OSWER #9285.2-0
3109	7	FIELD STANDARD OPERATING PROCEDURES MANUAL #9-SITE SAFETY PLAN	04/01/85	- OSWER/OERR	Final	36	3	1) SAMPLE SITE SAFETY PLAN AND OSHA SAFETY PLAN 2) EMERGENCY OPERATION CODES REAL TIME MONITOR 3) RESPONSE SAFETY CHECK-OFF SHEET	OSWER #9285.2-0
3110	7	GEOPHYSICAL METHODS FOR LOCATING ABANDONED WELLS	07/01/84	- JRISCHKNECT, L.M., ET AL /U.S GEOLOGICAL SURVEY - VANCE, J.J /EMSL	Final	211	1		EPA-600/4-84-04
3111	7	GEOPHYSICAL TECHNIQUES FOR SENSING BURIED WASTES AND WASTE MIGRATION	06/01/84	- BENSON, R.C., ET AL /TECHNOS, INC - VANCE, J.J /EMSL	Final	236	1		EPA-600/7-84/06
3112	8	GUIDELINES AND SPECIFICATIONS FOR PREPARING QUALITY ASSURANCE PROGRAM DOCUMENTATION	06/01/87	- OSWER/QUALITY ASSURANCE MANAGEMENT STAFF	Final	31	3	1) MEMO GUIDANCE ON PREPARING QAPPS DATED 6/10/87	
3113	8	LABORATORY DATA VALIDATION FUNCTIONAL GUIDELINES FOR EVALUATING INORGANICS ANALYSES	07/01/88	- EPA DATA REVIEW WORK GROUP - BLEVINS, B /VIAR AND CO /SAMPLE MGMT OFFICE - HQED	Draft	30	3		
3114	8	LABORATORY DATA VALIDATION FUNCTIONAL GUIDELINES FOR EVALUATING ORGANICS ANALYSES	02/01/88	- BLEVINS, B /VIAR AND CO /SAMPLE MGMT OFFICE - EPA DATA REVIEW WORKGROUP - HQED	Draft	45	3		

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2115	0	PRACTICAL GUIDE FOR GROUND-WATER SAMPLING	09/01/85	- BARCELONA, M J , ET AL /ILLINOIS ST WATER SURVEY - SCALF, M R /ORD/ERL	Final	175	1		EPA/600/2-85/104
2116	0	SEDIMENT SAMPLING QUALITY ASSURANCE USER'S GUIDE	07/01/85	- BARTH, D S & STARKS, T S /UNIV OF NEV, LAS VEGAS - BROWN, K W /ERD	Final	120	1		EPA/600/4-85/048
2117	0	SOIL SAMPLING QUALITY ASSURANCE USER'S GUIDE	05/01/84	- BARTH, D S & MASON, B J /U OF NEVADA, LAS VEGAS - BROWN, K /ORD/ERD	Final	104	1		EPA 600/4-84/043
2118	9+	TEST METHODS FOR EVALUATING SOLID WASTE, LABORATORY MANUAL PHYSICAL/CHEMICAL METHODS, THIRD EDITION (VOLUMES IA, IB, IC, AND II)	11/01/86	- OSWER	Final	3000	1		
2119	11	USER'S GUIDE TO THE CONTRACT LABORATORY PROGRAM	12/01/88	- OSWER/OLP SAMPLE MANAGEMENT OFFICE	Final	220	2		OSWER 9240.0-1
**		RI/FS - Land Disposal Facility Technology							
2200	12	COVERS FOR UNCONTROLLED HAZARDOUS WASTE SITES	09/01/85	- MCANDREW, C.C., ET AL./U.S. COE/NES - HOUSTON, J M /HERL	Final	475	2		EPA/540/2-85/002
2201	13	DESIGN, CONSTRUCTION, AND EVALUATION OF CLAY LINERS FOR WASTE MANAGEMENT FACILITIES	11/01/88	- COLEMAN, J L., ET AL /AUS - ROLLER, M H /RREL	Final	500	2		EPA/530/SW-86/007F
2202	13	EVALUATING COVER SYSTEMS FOR SOLID AND HAZARDOUS WASTE	09/01/83	- LUTTON, R. J./U.S.A. COE/WES - LANDRETH, R E /HERL	Final	58	2		OSWER 9476.00-1
2203	13	GUIDANCE MANUAL FOR MINIMIZING POLLUTION FROM WASTE DISPOSAL SITES	08/01/78	- TOLMAN, A L., ET AL./A.T. MARTIN ASSOCIATES, INC. - SANNING, D E /HERL	Final	83	1		EPA-600/2-78-142
2204	13	LAND DISPOSAL RESTRICTIONS	08/11/87	- LONDEST, H L./OSWER - LUCERO, G./OMPE	Final	23	2	1) SUMMARY OF MAJOR LDR PROVISIONS AND CALIFORNIA LIST PROHIBITIONS 1) OTHER ATTACHS CITED ARE AVAILABLE IN	

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3305	14	LINING OF WASTE CONTAINMENT AND OTHER IMPOUNDMENT FACILITIES	09/01/88	· MATRECON, INC. · LANDRETH, R./ORD/RISK REDUCTION ENGINEERING LAB	Final	950	3	FED REG.	
3306	15	LINING OF WASTE IMPOUNDMENT AND DISPOSAL FACILITIES	03/01/83	· LANDRETH, R./MERL	Final	480	3		OSWER #9480.00-4
3307	15	PROCEDURES FOR MODELING FLOW THROUGH CLAY LINERS TO DETERMINE REQUIRED LINER THICKNESS	01/01/84	· ORD	Draft	145	3		OSWER #9480.00-9D
3308	15	RCRA GUIDANCE DOCUMENT LANDFILL DESIGN LINER SYSTEMS AND FINAL COVER	07/01/82	· EPA	Draft	30	3		
3309	15	SETTLEMENT AND COVER SUBSIDENCE OF HAZARDOUS WASTE LANDFILLS PROJECT SUMMARY	05/01/85	· MURPHY, W.L. · GILBERT, P.A.	Final	4	3		EPA-600/S2-85-035
3310	15	SUPPLEMENTARY GUIDANCE ON DETERMINING LINER/LEACHATE COLLECTION SYSTEM COMPATIBILITY	08/07/86	· MIDDLE, B.R./PERMITS AND STATE PROGRAMS DIV	Final	60	3	1) ANALYSIS AND FINGERPRINTING OF UNEXPOSED & EXPOSED POLYMERIC MEMBRANE LINERS MATRECON, INC 2) SEC. 3019 EXPOSURE INFO AND HEALTH ASSESSMENTS	OSWER #9480.00-13
3311	15	TECHNICAL GUIDANCE DOCUMENT: CONSTRUCTION QUALITY ASSURANCE FOR HAZARDOUS WASTE LAND DISPOSAL FACILITIES	10/01/86	· FEHRMANN, J.C./PERI/LAND POLLUTION CONTROL DIV. · OTHER	Final	88	3		OSWER #9472.003
4113	15	TREATMENT OF REACTIVE WASTES AT HAZARDOUS WASTE LANDFILLS PROJECT SUMMARY	01/01/84	· SKINNER, D. ET AL./ARTHUR D. LITTLE, INC. · LANDRETH, R./MERL	Final	4	3		EPA/600/S2-83/118
3000	25	APPLICABILITY OF THE RCRA MINIMUM TECHNICAL REQUIREMENTS RESPECTING LINERS AND LEACHATE COLLECTION SYSTEMS (Secondary Reference)	04/01/85	· SKINNER, J./ORD	Final	3	3		OSWER #9480.01(85)
**		RI/FS - Other Technologies							
3300	16	A COMPENDIUM OF TECHNOLOGIES USED IN THE TREATMENT OF HAZARDOUS WASTES	09/01/87	· ORD/CERI	Final	49	3		EPA/625/8-87/014

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2301	16	CARBON ADSORPTION ISOTHERMS FOR TOXIC ORGANICS	04/01/80	- LYMAN, W. A. /MERL - GLOSS, S. M. /MERL	Final	331	2		EPA/600/8-80-023
2302	17	ENGINEERING HANDBOOK FOR HAZARDOUS WASTE INCINERATION	09/01/81	- BONNER, T. A., ET AL /MONSANTO RESEARCH CORP. - OBERACKER, D. A. /OEET	Final	445	2		OSWER #9480.00-5
2303	17	EPA GUIDE FOR IDENTIFYING CLEANUP ALTERNATIVES AT HAZARDOUS WASTE SITES AND SPILLS: BIOLOGICAL TREATMENT	-	- PACIFIC NORTHWEST LABORATORY - RANDERE, L. C. /CORVALLIS ENVIRONMENTAL RESEARCH LAB	Final	120	2		EPA-600/2-83-063
2304	17	EPA GUIDE FOR INFECTIOUS WASTE MANAGEMENT	05/01/86	- OSWER/OSW	Final	75	2		OSWER #9410.00-1
2305	11	GUIDANCE DOCUMENT FOR CLEANUP OF SURFACE IMPOUNDMENT SITES	06/01/86	- COA/WOODWARD-CLYDE/ROY F. WESTON - BARRY, E. /OSWER	Final	99	1		OSWER #9380.0-06
2306	11	GUIDANCE DOCUMENT FOR CLEANUP OF SURFACE TANK AND DRUM SITES	05/30/85	- COA/WOODWARD-CLYDE/ROY F. WESTON/C. C. JOHNSON - BARRY, E. AND BINGLER, B. /OSWER	Final	135	1		OSWER #9380.0-03
2307	18	HANDBOOK FOR EVALUATING REMEDIAL ACTION TECHNOLOGY PLANS	08/01/83	- SHEPHERD, J. AND BASS, J. /ARTHUR D. LITTLE INC - FAIRON, H. R. /MERL	Final	439	1		EPA-600/2-83-076
2308	18	HANDBOOK FOR STABILIZATION/SOLIDIFICATION OF HAZARDOUS WASTE	06/01/86	- CULLINANE JR., M. J. ET AL /U.S. CORPS - HOUSCOFD, J. M. /ORDA/MERL	Final	125	1		EPA/540/2-86-001
2309	19	HANDBOOK REMEDIAL ACTION AT WASTE DISPOSAL SITES (REVISED)	10/01/85	- ORDA/MERL - OSWER/OERR	Final	560	1		EPA/625/6-85/006
2310	20	LEACHATE PLUME MANAGEMENT	11/01/85	- REPO, E. AND KLES, C. /JRB ASSOCIATES - BARKLEY, N. /EPA	Final	590	1		EPA/540/2-85/004
2311	20	MOBILE TREATMENT TECHNOLOGIES FOR SUPERFUND WASTES	09/01/86	- CAMP, DRESSER, AND MCKEE INC - CALER, L. D. /ARSD	Final	130	1		EPA/540/2-86-003F
2312	21	PRACTICAL GUIDE-TRIAL BURNS FOR HAZARDOUS WASTE INCINERATORS	04/01/86	- CORMAN, P., ET AL /MIDWEST RESEARCH INSTITUTE - OBERACKER, D. A. /HERL	Final	63	2		EPA/600/2-86/050
2313	21	PRACTICAL GUIDE-TRIAL BURNS FOR HAZARDOUS WASTE INCINERATORS, PROJECT SUMMARY	07/01/86	- CORMON, P., ET AL /MIDWEST RESEARCH INSTITUTE - OBERACKER, D. A. /HERL	Final	3	1		EPA/600/S2-86/050

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2314	2	PROHIBITION ON THE PLACEMENT OF BULK LIQUID HAZARDOUS WASTE IN LANDFILLS-STATUTORY INTERPRETIVE GUIDANCE	06/11/86	- OSWER/OSW	Final	35	1	1) MEMO RE SAME SUBJECT FROM WILLIAMS M E /OSW	OSWER #9487.0(
2315	2	REVIEW OF IN-PLACE TREATMENT TECHNIQUES FOR CONTAMINATED SURFACE SOILS-VOL 2 BACKGROUND INFORMATION FOR IN-SITU TREATMENT	11/01/84	- SIMS R C , ET AL /JRB ASSOCIATES - BARKLEY, N /MERL	Final	350	1		EPA-540/2-84-(
2316	2	REVIEW OF IN-PLACE TREATMENT TECHNIQUES FOR CONTAMINATED SURFACE SOILS-VOL 1 TECHNICAL EVALUATION	09/19/84	- OSWER/OERR - ORD/MERL	Final	165	1		EPA/540/2-84-(
2317	2	SLURRY WALL CONSTRUCTION FOR POLLUTION MIGRATION CONTROL	03/01/84	- CLAR - ORD/MERL	Final	230	1		EPA/540/2-84-(
2318	2	SYSTEMS TO ACCELERATE IN SITU STABILIZATION OF WASTE DEPOSITS	09/01/86	- MULLER, M , ET AL /ENVIROSPHERE CO - CRUBE, W /MERL	Final	385	1		EPA 540/2-86/(
2319	2	TECHNOLOGY SCREENING GUIDE FOR TREATMENT OF CERCLA SOILS AND SLUDGES	09/01/88	- OSWER/OERR	Final	130	1		EPA 540/2-88/(
2320	2	TREATMENT TECHNOLOGY BRIEFS ALTERNATIVES TO HAZARDOUS WASTE LANDFILLS	07/01/86	- MERL	Final	35	2		EPA/600/8-86/(
**		RI/FS - Ground-water monitoring & Protection							
2400	2	CRITERIA FOR IDENTIFYING AREAS OF VULNERABLE HYDROGEOLOGY UNDER RCRA STATUTORY INTERPRETIVE GUIDANCE	07/01/86	- OSWER/OSW	Final	950	2		OSWER #9472.0(
2401	2	FINAL RCRA COMPREHENSIVE GROUND-WATER MONITORING EVALUATION (CME) GUIDANCE DOCUMENT	11/19/86	- LUCERO, C A /OWPE	Final	55	2	1) RELATIONSHIP OF TECHNICAL INADEQUACIES TO GROUND-WATER PERFORMANCE STANDARDS	OSWER #9950.2
2402	2	GROUND-WATER MONITORING AT CLEAN-CLOSING SURFACE IMPOUNDMENT AND WASTE PILE UNITS	03/31/88	- PORTER, J W /OSWER	Final	3	2		OSWER #9476.0(
2403	2	GROUND-WATER PROTECTION STRATEGY	08/01/84	- OFFICE OF GROUND-WATER PROTECTION	Final	65	2		EPA/440/6-84-(
2404	2	GUIDELINES FOR GROUND-WATER CLASSIFICATION UNDER THE EPA GROUND-WATER PROTECTION STRATEGY	12/01/86	- OFFICE OF GROUND-WATER PROTECTION	Draft	600	2		
2405	2	OPERATION AND MAINTENANCE INSPECTION GUIDE (RCRA GROUND-WATER MONITORING SYSTEMS)	03/30/88	- OSWER/OWPE/RCRA ENFORCEMENT DIVISION	Final	50	2	1) TRANSMITTAL MEMO RE SAME SUBJECT	OSWER #9950.1

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2406	24	PROTOCOL FOR GROUND-WATER EVALUATIONS	09/01/86	- HAZARDOUS WASTE GROUND WATER TASK FORCE	Final	300	1		OSWER #9080 0-1
2407	25	RCRA GROUND-WATER MONITORING TECHNICAL ENFORCEMENT GUIDANCE DOCUMENT(TEGD)	09/01/86	- EPA	Final	270	1		OSWER #9950 1
2408	25	RCRA GROUND-WATER MONITORING TECHNICAL ENFORCEMENT GUIDANCE DOCUMENT, TEGD: EXECUTIVE SUMMARY	07/01/87	- LUCERO, C.A /OWPE	Final	8	1		OSWER #9950 1-8
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3000	35	APPLICABILITY OF THE RCRA MINIMUM TECHNICAL REQUIREMENTS RESPECTING LINERS AND LEACHATE COLLECTION SYSTEMS	04/01/85	- SKINNER, J /OSW	Final	3	1		OSWER #9480 01(85)
3001	35	CERCLA COMPLIANCE WITH OTHER ENVIRONMENTAL STATUTES	10/03/85	- PORTER, J W /OSWER	Final	19	1	1) POTENTIALLY APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS	OSWER #9234 0-2
3002	35	CERCLA COMPLIANCE WITH OTHER LAWS MANUAL	08/08/88	- OERR	Draft	345	1		OSWER #9234 1-01
3003	35	EPA'S IMPLEMENTATION OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986	05/21/87	- THOMAS, L. M /EPA	Final	4	1		
3004	35	GUIDANCE MANUAL ON THE RCRA REGULATION OF RECYCLED HAZARDOUS WASTES	03/01/86	- INDUSTRIAL ECONOMICS, INC - OSW	Final	350	1		OSWER #9441 00-1
3005	35	INTERIM RCRA/CERCLA GUIDANCE ON NON-CONTIGUOUS SITES AND ON-SITE MANAGEMENT OF WASTE AND TREATMENT RESIDUE	03/27/86	- PORTER, J W /OSWER	Final	8	1	1) COMBINING HAZARDOUS WASTE SITES FOR REM. ACTION	OSWER #9347 0-1
3400	23	CRITERIA FOR IDENTIFYING AREAS OF VULNERABLE HYDROGEOLOGY UNDER RCRA STATUTORY INTERPRETIVE GUIDANCE [Secondary Reference]	07/01/86	- OSWER/OSW	Final	950	1		OSWER #9472 00-1A
3401	24	FINAL RCRA COMPREHENSIVE GROUND-WATER MONITORING EVALUATION (CME) GUIDANCE DOCUMENT [Secondary Reference]	11/19/86	- LUCERO, C.A./OWPE	Final	55	1	1) RELATIONSHIP OF TECHNICAL INADEQUACIES TO GROUND-WATER PERFORMANCE STANDARDS	OSWER #9950 2
3405	24	OPERATION AND MAINTENANCE INSPECTION GUIDE (RCRA GROUND-WATER MONITORING SYSTEMS) [Secondary Reference]	03/30/88	- OSWER/OWPE/RCRA ENFORCEMENT DIVISION	Final	50	1	1) TRANSMITTAL MEMO RE SAME SUBJECT	OSWER #9950-3
3407	25	RCRA GROUND-WATER MONITORING TECHNICAL ENFORCEMENT GUIDANCE DOCUMENT(TEGD) [Secondary Reference]	09/01/86	- EPA	Final	270	1		OSWER #9950 1
3408	25	RCRA GROUND-WATER MONITORING TECHNICAL ENFORCEMENT GUIDANCE DOCUMENT, TEGD: EXECUTIVE SUMMARY [Secondary Reference]	07/01/87	- LUCERO, C.A./OWPE	Final	8	1		OSWER #9950 1-8

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9001	33	RCRA/CERCLA DECISIONS MADE ON REMEDY SELECTION (Secondary Reference)	06/24/85	- KILPATRICK, M /COMPLIANCE BRANCH, OWPE	Final	3	3		
**		Water Quality							
4000	36	ALTERNATE CONCENTRATION LIMIT GUIDANCE PART 1. ACL POLICY AND INFORMATION REQUIREMENTS	07/01/87	- OSW/HWD	Final	126	3		OSWER 09481.00-(
4001	36	GUIDANCE DOCUMENT FOR PROVIDING ALTERNATE WATER SUPPLIES	03/01/88	- OERR	Final	64	3		OSWER 09355.3-01
4002	36	INTERIM FINAL GUIDANCE ON REMOVAL ACTION LEVELS AT CONTAMINATED DRINKING WATER SITES	10/06/87	- OSWER/OERR	Final	9	3		OSWER 09360.1-01
4003	36	QUALITY CRITERIA FOR WATER 1986	05/01/87	- OFFICE OF WATER REGULATIONS AND STANDARDS	Final	335	3		EPA/440/5-86-001
3301	16	CARBON ADSORPTION ISOTHERMS FOR TOXIC ORGANICS (Secondary Reference)	04/01/80	- DOBBS, R A /HERL - COHEN, J M /HERL	Final	331	3		EPA/600/8-80-023
1005	1	INFORMATION ON DRINKING WATER ACTION LEVELS (Secondary Reference)	04/19/88	- FIELDS, JR., T /OSWER/ERD	Final	17	3	1) MEMO RELEASES FROM LAWFULLY APPLIED PESTICIDES 2) MEMO DBCP CONTAMINATION 3) GUIDANCE FOR ETHYLENE DIBROMIDE IN DRINKING H2O	
*		Risk Assessment							
5000	37	ATSDR HEALTH ASSESSMENTS ON NPL SITES	06/16/86	- DEPT OF HEALTH AND HUMAN SERVICES/ATSDR	Draft	14	3		
5001	37	CHEMICAL, PHYSICAL & BIOLOGICAL PROPERTIES OF COMPOUNDS PRESENT AT HAZARDOUS WASTE SITES	09/27/85	- CLEMENT ASSOCIATES, INC.	Final	330	3		OSWER 09850.3
5002	37	FINAL GUIDANCE FOR THE COORDINATION OF ATSDR HEALTH ASSESSMENT ACTIVITIES WITH THE SUPERFUND REMEDIAL PROCESS	05/14/87	- PORTER, J W /OSWER/OERR - ATSDR	Final	22	3	1) SAME TITLE, DATED 4/22/87	OSWER 09285.4-01
5003	37	GUIDELINES FOR CARCINOGEN RISK ASSESSMENT (FEDERAL REGISTER, SEPTEMBER 24 1986, p 33992)	09/24/86	- EPA	Final	13	3		

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5004	37	GUIDELINES FOR EXPOSURE ASSESSMENT (FEDERAL REGISTER, SEPTEMBER 24, 1986, p. 34041)	09/24/86	- EPA	Final	14	3		
5005	37	GUIDELINES FOR HEALTH ASSESSMENT OF SUSPECT DEVELOPMENTAL TOXICANTS (FEDERAL REGISTER, SEPTEMBER 24, 1986, p. 34028)	09/24/86	- EPA	Final	14	3		
5006	37	GUIDELINES FOR MUTAGENICITY RISK ASSESSMENT (FEDERAL REGISTER, SEPTEMBER, 24, p 34006)	09/24/86	- EPA	Final	8	3		
5007	37	GUIDELINES FOR THE HEALTH RISK ASSESSMENT OF CHEMICAL MIXTURES (FEDERAL REGISTER, SEPTEMBER 24, 1986, p. 34014)	09/24/86	- EPA	Final	13	3		
5008	38+	HEALTH EFFECTS ASSESSMENT DOCUMENTS (50 CHEMICAL PROFILES) VOL 38 ACETONE, ARSENIC, ASBESTOS, BARIUM, BENZO(A)PYRENE, CADMIUM, CARBON TETRACHLORIDE, CHLOROBENZENE, CHLORDANE, CHLOROFORM, COAL TARS, COPPER, CRESOLS, CYANIDE, DDT, 1,1-DICHLOROETHANE, 1,2-DICHLOROETHANE: VOL 39 1,1-DICHLOROETHYLENE, 1,2-DICHLOROETHYLENE, CIS-1,2-DICHLOROETHYLENE, ETHYLBENZENE, GLYCOL ETHERS, HEXACHLOROBENZENE, HEXACHLOROBUTADIENE, HEXACHLOROCYCLOPENTADIENE, HEXAVALENT CHROMIUM, IRON (AND COMPOUNDS), LEAD, LINDANE, MANGANESE (AND COMPOUNDS), MERCURY, METHYL ETHYL KETONE, METHYLENE CHLORIDE, NAPHTHALENE, NICKEL, PENTACHLOROPHENOL, PHENOL, PHENANTHRENE, VOL 40 POLYCHLORINATED BIPHENYLS (PCBS), POLYCYCLIC AROMATIC HYDROCARBONS (PAHS), PYRENE, SELENIUM (AND COMPOUNDS), SODIUM CYANIDE, SULFURIC ACID, 2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN, 1,1,2,2-TETRACHLOROETHANE, TETRACHLOROETHYLENE, TOLUENE, 1,1,2-TRICHLOROETHANE, 1,1,1-TRICHLOROETHANE, TRICHLOROETHYLENE, 2,4,5 TRICHLOROPHENOL, 2,4,6-TRICHLOROPHENOL, TRIVALENT CHROMIUM, VINYL CHLORIDE, XYLENE, ZINC (AND COMPOUNDS)	09/01/84	- ORD/CHEA/ECAO - OSWER/OERR	Final	1750	3		EPA/540/1-86/001-05A
5009	31	INTEGRATED RISK INFORMATION SYSTEM (IRIS) (A COMPUTER-BASED HEALTH RISK INFORMATION SYSTEM AVAILABLE THROUGH E-MAIL--HOTLINE ON ACCESS IS INCLUDED)	-	- CHEA	Final	-	3		

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5010	1)	INTERIM POLICY FOR ASSESSING RISKS OF "DIOXINS" UNDER RMN 8.3.7.6-1000	01/07/87	- RHOMAS, L M /EPA	Final	50	2	1) INTERIM PROCEDURES FOR ESTIMATING RISKS ASSOCIATED WITH EXPOSURES TO MIXTURES: 10/86	
5011	1)	PUBLIC HEALTH RISK EVALUATION DATABASE (PHRED) [USER'S MANUAL AND TWO DISKETTES CONTAINING THE DBASE(III PLUS SYSTEM ARE INCLUDED]	09/16/88	- OSWER/TOXICS INTEGRATION BRANCH	Final	-	3		
5012	1)	ROLE OF ACUTE TOXICITY BIOASSAYS IN THE REMEDIAL ACTION PROCESS AT HW/MIXED WASTE SITES	08/01/87	- ARNEY, L A, ET AL /PACIFIC NORTHWEST LABORATORY - MILLER, W E /CORVALLIS ENVIRONMENTAL RESEARCH LAB	Final	106	2		EPA/600/8-87/0
5013	1)	SUPERFUND EXPOSURE ASSESSMENT MANUAL	04/01/88	- OSWER	Final	160	1		OSWER #9285.5-
5014	1)	SUPERFUND PUBLIC HEALTH EVALUATION MANUAL	10/01/86	- OSWER - OSWER	Final	500	1		OSWER #9285.4-
5015	1)	TOXICOLOGY HANDBOOK	06/01/85	- LIFE SYSTEMS, INC - TYSKLIWICH, T E /OHPE	Draft	136	2		OSWER #9850.2
6000	1)	ENVIRONMENT ASSESSMENT GUIDANCE [Secondary Reference]	11/22/85	- PORTER, J W /OSWER	Final	11	2		OSWER #9850.0-
**	Cost Analysis								
6000	1)	REMEDIAL ACTION COSTING PROCEDURES MANUAL	10/01/87	- JRB ASSOCIATES/O'DONNELL - ORD/HERL - OSWER/OERR	Final	56	1		
6001	1)	REMOVAL COST MANAGEMENT MANUAL	04/01/88	- OSWER/OERR	Final	170	1		OSWER #9360.0-
1003	1	ENVIRONMENTAL REVIEW REQUIREMENTS FOR REMOVAL ACTIONS [Secondary Reference]	04/13/87	- OERR/ERD	Final	6	2		OSWER #9318.0-
**	Community Relations								
7000	1)	COMMUNITY RELATIONS IN SUPERFUND: A HANDBOOK (INTERIM VERSION)	06/01/88	- OERR	Final	184	2	1) CWP 6 OF THE COMMUNITY RELATIONS HANDBOOK 11/03/88	OSWER #9230.0-

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COMPENDIUM OF CERCLA RESPONSE SELECTION GUIDANCE DOCUMENTS

DOC NO	Vol	Title	Date	Authors	Status	Pages	Tier	Attachments	OSWER/EPA Number
**		Enforcement							
8000	33	ENDANGERMENT ASSESSMENT GUIDANCE	11/22/85	- PORTER, J W /OSWER	Final	11	1		OSWER #9850.0-1
8001	33	INTERIM GUIDANCE ON POTENTIALLY RESPONSIBLE PARTY PARTICIPATION IN REMEDIAL INVESTIGATIONS AND FEASIBILITY STUDIES	05/16/88	- PORTER, J W /OSWER	Final	37	1		OSWER #9835.18
**		Selection of Remedy/Decision Documents							
9000	33	INTERIM GUIDANCE ON SUPERFUND SELECTION OF REMEDY	12/24/86	- PORTER, J W /OSWER	Final	10	1		OSWER #9355.0-19
9001	33	RCRA/CERCLA DECISIONS MADE ON REMEDY SELECTION	06/24/85	- KILPATRICK, M /COMPLIANCE BRANCH, OWPE	Final	1	1		

Appendix A

FISHER-CALO
KINGSBURY, INDIANA
RESPONSIVENESS SUMMARY

I. RESPONSIVENESS SUMMARY OVERVIEW

In accordance with CERCLA Section 117, a public comment period was held from April 13 to June 13, 1990, to allow interested parties to comment on the United States Environmental Protection Agency's (U.S. EPA's) Feasibility Study (FS) and Proposed Plan for a final remedy at the Fisher-Calo Superfund site. At an April 26, 1990, public meeting, U.S. EPA and IDEM presented the Proposed Plan for the Fisher-Calo site, answered questions and accepted comments from the public. Written comments were also received through the mail.

II. BACKGROUND ON COMMUNITY CONCERN

The Fisher-Calo site is comprised of four areas in the Kingsbury Industrial Development Park in LaPorte County, Indiana. Located about 2 miles southwest of the site are the villages of Tracy (population 1000) and Kingsford Heights (population 1200). The nearest large municipal area is the City of LaPorte (population 25,000).

A fire at the site in 1978 created significant public concern, raising the issue of the possibility of another fire or a possible explosion. Current issues include concerns about the ground water and movement of the plume of contamination.

III. SUMMARY OF SIGNIFICANT COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND U.S. EPA RESPONSES

The comments are organized into the following categories:

A. Summary of comments from the local community

1. Comments regarding public notice of feasibility study
2. Comments regarding length of the public comment period
3. Comments regarding the TAG process
4. Comments regarding the proposed incinerator
5. Comments regarding past experience with U.S. EPA at the site
6. Comments regarding other potential remedies for the site.
7. Comments regarding aspects of the preferred alternative other than incineration
8. Comments regarding speed with which the remedial action is undertaken
9. Comments regarding site access for local officials
10. Comments regarding an area in Porter County, Indiana were debris is located.

B. Summary of comments from Potentially Responsible Parties.

The comments are paraphrased in order to effectively summarize them in this document. The reader is referred to the public meeting transcript and written

comments which are available at the public information repositories.

A. SUMMARY OF COMMENTS FROM THE LOCAL COMMUNITY

1. Comments were received about receipt of the Feasibility Study at the LaPorte County Health Department. It was believed that the Study was not available when the public notice said it was.

U.S. EPA Response: The Feasibility Study and Proposed Plan were sent to the two information repositories (the LaPorte County Health Department and the LaPorte Public Library) by U.S. Mail-Next Day Service on April 12, 1990. Receipt by the library was confirmed by phone on April 13. A phone call to the U.S. EPA Community Relations Coordinator by a staff member at the Laporte County Health Department indicated it had not arrived there, but a follow-up call by the same staff member confirmed that it had arrived.

2. Comments were received indicating the public meeting is one of the few chances the public has to comment on the Feasibility Study and Proposed Plan and that the public comment period was not of sufficient length.

U.S. EPA Response: Public notice published April 11, 1990 announced the comment period was to run through May 14, 1990. The public was told it could make comments by mailing them to the Community Relations Coordinator at U.S. EPA and that comments would be received at the public meeting April 26, 1990. Subsequently a request was received asking that the public comment period be extended. That extension was granted and it was announced by public notice on May 11, 1990 that the comment period had been extended to June 13, 1990. Also, U.S. EPA personnel have been available to the public throughout the investigation and study process via phone, mail or at public meetings.

3. In a series of questions, clarification was requested about the Technical Assistance Grant (TAG) process. U.S. EPA indicated the TAG could be made available to hire contractors to "do some studies or review the studies that are being done."

U.S. EPA Response: TAGs are available to citizens' groups who are interested in hiring a consultant to help interpret information regarding site investigation and clean-up. They are available at any time during the investigation/clean-up process. They are not made available to do new or independent studies.

4. Comments regarding incineration

a. Comment: One commenter expressed concern that the incinerator be monitored to assure that the PCBs and other toxic materials are removed to a level of 99.9999% as projected and that temperatures in excess of 1600 degrees fahrenheit may be required to achieve this level.

U.S. EPA Response: As part of the requirements of the Resources Conservation and Recovery Act (RCRA) and the Toxic Substances Control Act (TSCA), any incinerator used at the site must be monitored to achieve 99.9999% Destruction Removal Efficiency (DRE) for PCBs and 99.99% DRE for other compounds. These

regulations apply to and shall be met at the Fisher-Calo site. Temperatures in excess of 1600°F are not always necessary to achieve the above-stated DREs. The type of incinerator used for the cost estimates in the FS Report, the circulating bed combustor, can achieve the required DREs at temperatures near or less than 1600°F. Achieving the DREs is a function of temperature, residence time, and feed rate/mixing, so the temperature can vary if the other parameters are changed.

b. Comment: Two commenters expressed concern about the incinerator being installed and remaining on-site after project completion or receiving waste other than those from the Fisher-Calo site.

U.S. EPA Response: As part of the selected remedy, a mobile incineration unit would be installed on-site to only incinerate contaminated soils from the Fisher-Calo site, Kingsbury, Indiana, and would dismantled and removed from the site after project completion.

c. Comment: During the April 26, 1990 public meeting, one commenter stated that Alternate 4 is not the right alternative and does not meet eight of the nine evaluation criteria.

U.S. EPA Response: U.S. EPA has determined that Alternative 4 is the appropriate remedy for the site and disagrees with the statement made regarding the nine criteria. Alternative 4 achieves overall protectiveness, long-term effectiveness and reduction in toxicity, mobility, and volume, is implementable and accepted by the State of Indiana, and, if property implemented, will achieve compliance with all applicable or relevant and appropriate requirements of other environmental laws and will not present an unacceptable short-term risk to public health and the environment. Thus, Alternative 4 "meets" seven of the nine criteria; the two remaining criteria, cost and community acceptance, are marginally achieved by Alternative 4. This Alternative satisfies U.S. EPA's standard of representing the best balance of the nine criteria.

d. Comment: Two commenters expressed concern over disposal of waste ash from the incinerator, stating that high levels of heavy metals may create ground water contamination and that ash should be disposed of in an off-site hazardous waste landfill.

U.S. EPA Response: Incinerator ash will be tested to determine whether it may be "delisted". The delisting process allows U.S. EPA to exclude a specific waste at a specific facility from regulation as a hazardous waste, based on technical information provided to the Agency. Thus, delisted ash would not be considered to be a RCRA listed or characteristic hazardous waste. A sufficient number of samples will be taken to accurately characterize the contaminants in the ash. Ash which cannot be delisted will be disposed of in an off-site hazardous waste landfill. Ash which can be delisted will be used to backfill excavation areas. Delisted ash would not be regulated under any applicable laws and would not be considered leachable to the ground water; thus, delisted ash would not create ground water contamination. There is no reason to require special treatment of the delisted ash, and it is convenient and sensible to use it as backfill in excavated areas.

e. Comment: One commenter expressed concern over the lack of a requirement of a RCRA permit for an on-site incinerator.

U.S. EPA Response: Even though a RCRA permit is not required for CERCLA actions conducted entirely on-site, such as the incinerator to be used at the Fisher-Calo site, the incinerator would still be required to meet the performance standards, such as DREs, and the operational standards, such as temperature and automatic waste feed cutoff, required under RCRA and TSCA. Compliance with these standards will ensure proper operation of the incinerator.

f. Comment: One commenter expressed support for incineration as the proper method to remediate contaminated soils at the site and stated that all soils that could cause groundwater contamination should be excavated.

U.S. EPA Response: U.S. EPA appreciates the support of the selected remedy. The selected remedy will, in fact, involve the excavation of all PCB and semivolatile contaminated soils that could cause ground water contamination; however, VOC-contaminated soils will be remediated by soil flushing and/or other treatment, such as soil vapor extraction if proven effective at the site. It is not appropriate to incinerate the VOC contaminated soil at this site, given the low soil cleanup levels necessary to prevent further ground water contamination.

g. Comment: One commenter expressed concerns about the quality and accuracy of the testing of waste ash during a continuous burn operation of an incinerator.

U.S. EPA Response: The incinerator to be employed at the Fisher-Calo site is not required to be a continuous burn operation; it is required to meet the provisions of RCRA and TSCA. If an incinerator such as that used for cost estimates in the FS Report (circulating bed combustor)is employed, ash would be randomly sampled from the hopper used to collect the ash. A circulating bed combustor is not "continuous" in the true sense of the word. Waste is pulsed into the composition chamber, not fed on a conveyor belt.

h. Comment: One commenter expressed concerns about the release and subsequent environmental accumulation of dioxins and furans, especially 2,3,7,8 TCDD.

U.S. EPA Response; Dioxin precursors, those compounds such as polychlorinated biphenyls (PCBs), which might combine to form dioxins, were found at low concentrations at the site and at isolated locations. The estimated volume of PCB-containing soil to be incinerated is 1500 cubic yards, which is only 5% of the estimated quantity of soil to be incinerated. In addition, the incinerator will be required to meet DREs of 99.9999% for PCBs which assures virtual complete combustion, and therefore, very minimal formation of dioxins and furans. Studies have shown that chlorine is preferentially converted to hydrogen chloride (HCl) gas during the incineration process. Emissions of HCl will be monitored to ensure EPA emission standards (under RCRA) are being met. All of these factors combined make the possibility of dioxin formation during incineration very low.

5. Comment regarding past experience with U.S. EPA at the Fisher-Calo site.

Comment: One commenter stated that he had a good working relationship with U.S. EPA during previous immediate removal actions and has respect for U.S. EPA

U.S. EPA Response: U.S. EPA appreciates this statement, thanks the commenter for his input, and hopes to continue with a good working relationship throughout the remedial action for the site.

6. Comments regarding other potential remedies for the site.

A. Comment: One commenter stated they felt that chemical fixation/stabilization and solidification/stabilization would be particularly effective at the Fisher-Calo site.

U.S. EPA Response: U.S. EPA has determined that chemical fixation/stabilization and solidification/stabilization are not the most appropriate remedies at the site for a number of reasons including the fact that those technologies would not permanently treat the soil, only contain it. The selected remedy would permanently treat the onsite soil, and is preferred to chemical fixation and solidification/stabilization.

B. Comment: Two commenters stated that biological degradation (biological remediation) would be an effective treatment at the Fisher-Calo site.

U.S. EPA Response: U.S. EPA agrees that biological remediation is a technology that may have potential application at the Fisher-Calo site. We do not feel, though, that bioremediation can be used as the sole remedy at the Fisher-Calo site because it has a range of effectiveness depending on site specific conditions, and is not as proven as the treatments listed in the selected remedy, among other reasons. Therefore, bioremediation was not included in the selected remedy.

C. Comment: One commenter stated that soil vapor extraction would be an effective treatment at the Fisher-Calo site because the vast majority of the contaminants in the soil are of a volatile nature.

U.S. EPA Response: U.S. EPA agrees that soil vapor extraction can be an effective and proven treatment with volatile contaminants in soils, but not effective with PCBs, non-volatile and semi-volatile contaminants. However, based on the comments received, U.S. EPA has allowed for the use of soil vapor extraction in the ROD, if proven effective, for areas containing only volatile organic contamination.

7. Comments regarding aspects of the preferred alternative other than incineration.

A. Comment: Two commenters stated that it would be more desirable to reinject the treated groundwater rather than discharge it to Travis Ditch.

U.S. EPA Response: Based on public comment, the selected remedy will reinject

treated groundwater back into the underlying affected aquifer rather than discharge it to Travis Ditch.

B. Comment: One commenter stated that the site should be completely secured to limit vehicular traffic.

U.S. EPA Response: Based on public comment, the Fisher-Calo site will be secured with a perimeter fence.

C. Comment: One commenter stated that the asbestos plan should be reassessed to include all building siding and roofing being removed, and the site should be completely cleaned of all crumbling and discarded asbestos material.

U.S. EPA Response: U.S. EPA feels that asbestos stabilization in the site buildings is preferred to removal and disposal, as removal creates an increased exposure risk to site workers and the public.

8. Two commenters stated that they wanted the site contamination to be cleaned up as quickly as possible.

U.S. EPA Response: U.S. EPA also desires that the site cleanup proceed quickly. That is why we are utilizing both removal and remedial actions at the site. U.S. EPA has already initiated a removal action to deal with any risks posing an immediate threat to the public. The selected remedy will deal with the long-term risks at the Fisher-Calo site.

9. One commenter stated that local officials should have access to the Fisher-Calo site for independent monitoring.

U.S. EPA Response: U. S. EPA encourages any additional assistance that state and local officials wish to provide. We welcome state and local officials who have independent access agreements as long as the individuals have completed the required safety training for hazardous waste site access.

10. Comment regarding an area in Porter County, Indiana where debris is located.

Comment: One resident of Michigan City, Indiana Stated that there is a very large debris dump in a residential neighborhood in Porter County, Indiana which is lowering property values and possibly creating an unsafe environment. The commenter inquired as to where help could be found.

U.S. EPA Response: As this is not an issue which U.S. EPA has authority to deal with under the Superfund program, the comment letter is being forwarded to the local health department.

B. Summary of Comments from Potentially Responsible Parties (PRPs).

1. Comment: One PRP submitted a report regarding an alternate soils cleanup method (as opposed to incineration) and made the comments that incineration is far too costly and that a modification of Alternative 3 be adopted for this site which would employ this alternate soils cleanup method, namely (1) limited

excavation and off-site incineration of PCB contaminated soil, (2) on-site soil vapor extraction, (3) in-situ biodegradation, and (4) in-situ fixation.

U.S. EPA Response: U.S. EPA reviewed the report submitted with the comment, which provides supporting documentation for the alternate soils cleanup method, and thanks the commenter for providing this documentation.

U.S. EPA agrees that incineration is a more costly option than the modification of Alternate 3 presented by the commenter; however, cost is only one of nine criteria used to evaluate remedies for a site. U.S. EPA agrees with the commenter to the extent that, given the required soil cleanup levels for VOCs, technologies other than incineration may be more appropriate for VOCs at this site. A treatment such as soil vapor extraction if proven effective, or soil flushing can be applied for VOCs in soils at the site, and the ROD has been written to reflect this. U.S. EPA also agrees that incineration is the appropriate treatment technology for PCB-contaminated soil. U.S. EPA does not agree that an off-site incinerator is required for the PCB-contaminated soils or that in-situ biodegradation is appropriate for soils contaminated with semi-volatile compounds. Please refer to the response to comment 4.c. above for a description of how alternative 4, as amended by the changes made in response to public comments, meets the nine evaluation criteria. Basically, incineration is likely to be more costly than in-situ biodegradation; however, higher cost is justified by the fact that any incinerator used will be required to meet a 99.99% DRE for semivolatiles and that incineration is a proven, effective method to permanently destroy semivolatiles. Permanence of remedies is a preference stressed in both SARA and the new National Contingency Plan (NCP), and incineration, if properly implemented, will achieve permanent destruction of nearly all of the semivolatiles in soils requiring cleanup. In-situ biodegradation is an unproven innovative technology for treatment of soils contaminated with the semivolatile compounds found in higher concentrations at the Fisher-Calo site. There is uncertainty as to the effectiveness of in-situ biodegradation in treating these semi-volatiles. It has not been demonstrated that the cleanup levels required in the ROD can be achieved by this technology. It is for these reasons that in-situ biodegradation was screened out in the Feasibility Study and not recommended in the Proposed Plan. The commenter is referred to the Feasibility Study for an in-depth discussion of the relative merits of incineration and disadvantages of in-situ biodegradation and other related technologies.

In summary, U.S. EPA agrees with the commenter that 1) incineration is appropriate for PCB-contaminated soil and 2) soil vapor extraction or similar technology may be appropriate for VOC-contaminated soils that remain after PCB and semivolatile-contaminated soils are incinerated. U.S. EPA disagrees with the commenter that in-situ biodegradation is appropriate for remediating semivolatile-contaminated soils because it is innovative, unproven technology for use on the semivolatiles found at the site, and the cleanup levels and the remedial action goals in the ROD may not be achieved by this technology. Incineration, on the other hand, is a proven technology which will result in permanent destruction of the bulk of the semivolatiles contained in these soils, which is consistent with the preferences stated in SARA and the NCP. U.S. EPA is confident that use of incineration to treat semivolatile-contaminated soils will achieve the soil cleanup levels and the remedial action

goals stated in the ROD . Given these facts, the additional cost of incineration is clearly justified.

2. One commenter submitted comments on behalf of the Fisher-calo PRP Steering Committee. The comments were submitted in report form with an executive summary at the beginning of the report. The following comments were made in the executive summary (copied verbatim). EPA's response follows each comment.

a. Comment: The FS is based on an inadequate RI. The areas of soil and ground water contamination have not been delineated. Therefore, there is not sufficient information in the RI to support a Feasibility Study with a rational and defensible evaluation of remedial alterative and costs.

U.S. EPA Response: U.S. EPA disagrees with these statements. As with any RI, there are data gaps; however, the RI data, along with data gathered before and after the RI and during removal activities at the Two-Line Road property, sufficiently delineate the areas of contamination and provide sufficient information for the selection of a remedy for the Fisher-Calo site. Cost estimates provided in any FS Report contain a measure of uncertainty; detailed cost estimates are required in the subsequent Remedial Design phase. The cost estimates provided in the FS Report, as amended by public comments, are sufficient for screening the remedial alternatives and selecting the appropriate remedy for the site.

b. Comment: The FS used conservative and arbitrary exposure assessments to develop remedial goals. In addition, the remediation goals used in the FS are inconsistent with the Risk Assessment.

U.S. EPA Response: U.S. EPA disagrees with these statements. Remedial goals for the Fisher-Calo site were developed consistent with U.S. EPA guidance and approaches used for other Superfund sites, and remediation goals stated in the FS are consistent with the Risk Assessment, namely, groundwater is the main pathway of concern, soil or sediment contamination presents a potential direct contact risk in several isolated areas, soil contamination represents a source of continuing ground water contamination, and asbestos on and around existing structures presents a potential risk via inhalation.

c. Comment: The most effective remedial technology (soil vapor extraction) was eliminated for insufficient reasons. Soil vapor extraction is well suited to remove the predominant site contaminants, volatile organic compounds (VOCs).

U.S. EPA Response: Soil vapor extraction (SVE) is not the most effective remedial technology. In fact, SVE was eliminated from the final list of alternatives because it is <u>not</u> effective in treating semivolatiles and PCBs. However, U.S. EPA agrees that SVE may be effective in removing VOCs from the soils, and the ROD has been written to allow for the use of SVE, if proven effective, for VOCs at this site.

d. Comment: The conceptual design for ground water remedial technologies is misconfigured. In most of the alternatives, activated carbon was placed ahead of air stripping, which is contrary to normal practice.

U.S. EPA Response: U.S. EPA agrees with the commenter. The FS language was ambiguous, and it was never U.S. EPA's intent to use activated carbon ahead of air stripping. The ROD has been written to reflect the correct sequence of treatment, as stated by the commenter.

e. Comment: There is no reliable basis for the estimates of soil volumes to be remediated. In the FS, more than one-half of the study areas were characterized based upon a single soil sample location, contrary to accepted practice. Actual soil volumes requiring remediation could be an order of magnitude larger or smaller than those assumed in the FS. The technology selection and cost analysis based on the estimated soil volumes are suspect.

U.S. EPA Response: U.S. EPA disagrees with this comment. It is true that, due to the size and complexity of this site, it is more difficult to accurately estimate the soil volumes requiring treatment than it would be for some other sites; however, U.S. EPA has determined that cost estimates provided in the FS, as amended by public comments, are sufficient to allow comparison of alternatives and the selection of the appropriate remedy for the site.

f. Comment: The FS recommends Alternative 4. A major cost component of this alternative is incineration of soil. Incineration was selected because of its ability to remediate base-neutral organics and PCBs, as well as volatile organics. However, volatile organics (the major contaminant of concern at the site) can be more effectively addressed by soil vapor extraction. The evaluation of feasibility, implementability, and cost of this alternative is seriously flawed.

U.S. EPA Response: See Response to comment B.2.c. above.

g. Comment: Several significant inconsistencies and errors in the cost analysis for Alternative 4 were corrected and using the unsupported soil volumes assumed in the FS, the costs were recomputed to be about $55 million rather than EPA's estimate of $27 million.

U.S. EPA Response: U.S. EPA appreciates the cost analysis provided in this report. In response to this comment, U.S. EPA has amended its cost estimate for Alternative 4 from $27 million to $37 million. However, the selected remedy includes elements not included in Alternative 4 and has included different treatment for VOCs in soils and reinjection of treated groundwater. The cost estimate for the actual selected remedy is $31,685,000.

h. Comment: Available data suggest the appropriate combination of technologies to remediate the site is soil vapor extraction in conjunction with groundwater collection and treatment. In-situ stabilization is appropriate to remediate limited areas of semi-volatile and metals-contaminated soil. Limited areas of PCB-contaminated soil could be excavated or stabilized. The estimated cost of remediating the site with the appropriate combination of technologies is about $19.3 million. This combination of technologies would achieve the remediation objectives.

U.S. EPA Response: With respect to soil vapor extraction, refer to the response to comment B.1. above. In-situ stablization was screened out of the

final list of alternatives because, for the conditions of this site, it does not represent permanent treatment of semivolatile or PCB-contaminated soil, whereas incineration does. A more complete explanation of the screening of in-situ stabilization is included in the FS Report. It is not clear what is meant by "PCB-contaminated soil could be excavated". If this means "excavated and incinerated", U.S. EPA would agree. U.S. EPA believes that incineration of PCB and semivolatile-contaminated soil is appropriate at this site, even though it is somewhat more costly. Further discussion is included in the response to comment B.1. above.